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VOLUME 39, NUMBER 1, 2004

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I am pleased to announce that Professor Hervé Stolowy of HEC will assume the duties of Book Review Editor.

Professor Stephen A. Zeff has been a great Book Review Editor for six years and we owe him a debt of gratitude for his dedicated service.

Publishers should send books to be reviewed to our new Book Review Editor, Professor Hervé Stolowy.

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Compliance with flexible accounting standards

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Abstract

We examine to what extent firms adhere to the stated intent of noncompulsory accounting standards when reporting for intercorporate investments. The Generally Accepted Accounting Principles (GAAP) in Norway strongly recommend that a 20–50% intercorporate investment is accounted for by the equity method rather than the cost method, if the investment is long-term, of strategic importance, and involves significant influence. Even so, we find that the actual use of the equity method is independent of the duration of the investment period, the fraction of equity held, its recent growth, and the investor's voting power. This lack of compliance suggests that one cannot use the observed choice between the cost method and the equity method to infer the underlying characteristics of the investment as specified by the accounting standard. Flexible GAAP may therefore not induce firms to disclose the information that the GAAP were designed to produce.

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1. Introduction

A fundamental concern in accounting regulation is that financial statements are informative; that is, they reflect the underlying economic condition of the reporting firm. Two key questions in this context are whether firms comply with stated accounting principles (Zeff, 1995) and whether noncomplying firms ignore the standard to manage reported earnings (Bernard & Skinner, 1996; Guidry, Leone, & Rock, 1999; Mazay, Wilkins, & Zimmer, 1993). Whereas earnings management is relatively well explored in

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the academic literature, much less attention has been paid to compliance. This paper analyzes compliance in a regulatory environment, where the Generally Accepted Accounting Principles (GAAP) make it nontrivial for firm outsiders to determine whether the accounting standard is adhered to. The GAAP are explicitly stated and strongly recommended by regulatory bodies, but are still noncompulsory and open to judgment and interpretation. Such a regime of flexible accounting standards, which is quite common internationally (Cooper, 1996; Zeff, 1995), are very different from the rigid (i.e., legalistic, directive, and nonjudgmental) system in North America.

Our paper asks whether flexible GAAP ensure that the observed accounting method choice reflects the firm's underlying economic reality in the way intended by the regulator. We answer this question by empirically analyzing whether firms that account for intercorporate investments adhere to the flexible Norwegian GAAP (N GAAP) in choosing between the equity method and the cost method. The N GAAP state that if the investor has a significant influence over the investee, the investor should, but is not obliged to, use the equity method (i.e., consolidate to a limited extent) rather than the cost method (i.e., not consolidate). This general consolidation criterion is operationalized by requiring the investment (1) to be between 20% and 50% of the investee's outstanding equity, (2) to give the investor significant voting power relative to other investors, (3) to be considered a long-term holding, and (4) to be a natural component of the investor's overall corporate strategy. If these criteria are met, the investment should be accounted for by the equity method. Otherwise, the cost method is mandatory.

We find that less than 40% of the Oslo Stock Exchange (OSE) firms with 20–50% investments chose to consolidate during our sample period 1986–1994. The investors did not comply with the N GAAP, as the observed reporting practice is inconsistent with the predictions of the accounting regulations. Neither the relative voting power of the investor, the length of the investment period, the size of the investment, the investment's recent growth, nor its strategic fit influences the choice between the equity method and the cost method.

This evidence suggests that under flexible GAAP, the firms' accounting-method choice may be contrary to the regulators' intent. The regulator may be unable to influence the accounting practice if the standard lacks objective criteria for when an accounting method can be used, if there are no mandatory reporting principles ensuring that the method is used when the criteria are met, or if disciplining mechanisms for noncompliers are weak.

The paper is organized as follows. Section 2 describes the regulatory environment, and Section 3 states the hypotheses about complying reporting behavior as implied by the N GAAP. The methodology is specified in Section 4, whereas Section 5 describes our data selection procedures and presents descriptive statistics. The hypotheses are formally tested in Sections 6, and 7 summarizes and concludes the paper.

2. Regulation and flexibility

The major reason why compliance *per se* is seldom explored in accounting research is probably that in some regulatory regimes, separating compliers from noncompliers is

either irrelevant or trivial. Irrelevance occurs when there is no binding standard to comply with. Developing countries often have such nondirective systems (Ahmed & Nicholls, 1994; Rahman & Scapens, 1988), and some countries with strict, elaborate standards also end up here when enforcement is weak (Zeff, 1995). An example is the Australian pre-1984 GAAP, where firms were free to choose between the equity method and the cost method for 20–50% of investments (Mazay et al., 1993).¹

According to Zeff (1995), the United States is the prime example of rigid accounting regulations, driven by detailed, objective standards issued by the Financial Accounting Standards Board (FASB) and strict enforcement by the Securities and Exchange Commission (SEC). In such regimes, the GAAP state that according to readily observable criteria defining a set of contexts, accounting Principle A must be used in Context X, and Principle B must be used in Context Y. For instance, U.S. GAAP state that a 20–50% equity investment must be accounted for by the equity method, and that the cost method must be used if the investment is below 20% (FASB Opinion No. 18 §17, Statement on Accounting Standards No. 81). There is no room for the reporting firm's judgment and discretion, neither on the context nor what method to use in a given context. This inflexible system effectively ensures widespread compliance; thus, separating compliers from noncompliers is a trivial task.

Norway is between these two extremes of full flexibility and no flexibility. The GAAP is explicitly stated and strongly recommended by standard-setting bodies, but still open to judgment and interpretation. Based on the general framework specified in the corporate law, the details of the regulation are spelled out by the Ministry of Commerce, the state owned OSE,² and the private Norwegian Accounting Standards Board (NASB). The daily enforcement of the accounting standards for listed firms is carried out by the OSE, which can issue daily fines of NOK 500,000 (about USD 65,000) if firms fail to comply with the information requirement of the Stock Exchange Act or the NASB regulations.

According to §11–13 of the corporate law, an intercorporate investment may be accounted for by the equity method rather than the cost method if the investor has significant influence in the investee. However, this rule only applies to firms with group accounting statements, implying that the cost/equity choice is only open to investors who have at least one other investment of 50% or more, which must always be consolidated in full. If the 20–50% holding gives the investor significant influence, the investee is called an associated firm. Otherwise, it is not associated, and the N GAAP mandate the cost method.

The Ministry of Commerce (1987), the NASB (1991), and the OSE (1986, 1987a, 1987b, 1988) have defined the associate firm concept by four criteria.³ The equity method should be used if (i) the investor is sufficiently powerful relative to other owners, (ii) the investment is long-term, and (iii) the investment is a natural component of the investor's

¹ After 1984, Australia switched to a system where the cost method is mandatory, but where the effect of the equity method must be reported in footnotes (Mazay et al., 1993).

² The OSE was privatized after our sample period.

³ The criteria are specified in the first statement released by the OSE (1986), and later statements repeat and elaborate on them.

overall business strategy.⁴ The fourth and final criterion is the time consistency requirement that once an investor has chosen the equity method, the investor should continue using it in subsequent years unless the influence is unquestionably reduced.

This setting differs fundamentally from the inflexible, legalistic standard in the United States and in E.U. countries.⁵ First, except for the 20–50% requirement, insiders of the investing firm may argue that nobody else has the required information to determine whether an investment satisfies the associated-firm criterion of the N GAAP. Second, since the equity method is not mandatory for associated firms, the investor may still choose the cost method even if the investment qualifies for the equity method. Thus, both the criteria defining the context (associated or nonassociated firm) and the link between context and accounting method (equity method for associated firm vs. cost method for nonassociated firm) are judgmental, despite the fact that N GAAP strongly recommend how to interpret the criteria and how to choose the method. For the same two reasons, this setting allows us to empirically analyze how flexible accounting regulations influence observed accounting practice. In particular, we can explore whether investors using the equity method are more influential, strategic, and long term than investors using the cost method. The next section uses the N GAAP to generate testable hypotheses about the expected relationship between characteristics of the investment and the choice between the cost method and the equity method.

3. Empirical predictions

The general rule for *significant influence* is that the investor must control between 20% and 50% of the investee's voting equity, and no other investor should have significant influence. The latter restriction reflects the idea that your influence depends not only on your absolute share of voting equity, but also on the distribution of ownership among the remaining stockholders. Generally, the more dispersed the remaining ownership structure, the more influential the large investor. If the holding is below 20%, the investor must document that the influence is still significant relative to other owners. The N GAAP state that this should only be possible under "extraordinary circumstances" (Bettmo, Drake, Huneide, & Schwenke, 1989, p. 142).

Hypothesis 1: The propensity to use the equity method is higher the more voting equity the investor has relative to other investors.

According to the accounting standard, the investment is *long term* if the owner currently considers it a long-lived commitment. While the expected remaining holding period is not observable, the number of years to date that the stake of at least 20% has been held is public information. We argue in Section 4 that the information content of this

⁴ In a statement released by NASB in October 1993, strategic importance is no longer listed as a requirement. As this criterion is explicitly expressed in several OSE policy statements in our sample period, we will still use strategic importance as a criterion.

⁵ The International Accounting Standard (IAS) is similar to the U.S. GAAP in that the equity method is mandatory "unless it can be clearly demonstrated that the investor does not have significant influence" (IAS 28 §4).

backward looking duration measure is similar with that of expected remaining duration. In addition, because the past holding period is known to regulators, it becomes increasingly difficult for investors to credibly contend that the investment is short term as the holding period increases.

Hypothesis 2: The propensity to use the equity method increases with the number of years that the shares have been held.

N GAAP partially clarify the meaning of a *strategic* investment by excluding investments with no clear relationship to the investor's operational strategy (Bettmo et al., 1989, p. 141). Although there is no further specification in the standard, we would expect that for an investment to be of any significance in the firm's overall strategy, it must be of nonnegligible size and offer an opportunity to gain influence and information access. A larger investment increases the expected impact on the investor's overall cash flow. Moreover, the corporate-governance literature suggests that the larger the equity stake, the higher the probability of exerting monitoring power by communicating directly with management, voting at the stockholder meeting, and becoming a director (Shleifer & Vishny, 1997). Hence, the fraction held of the investee's equity may proxy for strategic importance. Moreover, if this fraction has recently grown, it may reflect the owner's decision to make the investment a more important part of his operational strategy. Consequently, if the investor complies with the intent of the N GAAP, we expect that:

Hypothesis 3. The propensity to use the equity method increases with the size and the growth of the investment.

As the N GAAP define a strategic investment relative to the investor's operations, we should also consider the strategic fit between the investor and the investee. According to Porter (1980, 1985), the fundamental concerns in corporate strategy are focus, specialization, and competence. This view suggests that value-maximizing firms acquire firms that strengthen their core competence when making intercorporate investments for strategic purposes. We would, for instance, expect that a shipping firm tends to invest in the shipping industry rather than in banking.

The view that intercorporate investments should foster specialization runs counter to the rationale for conglomerates, where firms buy other firms to become less rather than more specialized (Weston, Chung, & Hoag, 1990). However, empirical research shows time and time again that diversifying conglomerates destroy value, and that value is created once firms are split up into separate, specializing entities (Servaes, Rajan, & Zingales, 2000). Overall, this suggests that under the assumption of value-maximizing investors, we would expect that a 20–50% investment is more often strategic if the two firms' operations are related.

Hypothesis 4: The propensity to use the equity method is higher if the investor and the investee are in the same industry.

Time consistency requires that the investor does not shift from the equity method to the cost method, unless the conditions for using the equity method are no longer met. Since an external party cannot observe whether these criteria are satisfied, consider instead the weaker requirement that the investment is still in the 20–50% range. Using only public information, we can state the following testable prediction.

Table 1
The hypotheses

<i>N GAAP compliance</i>		
H1	The propensity to use the equity method is higher the more voting equity the investor has relative to other investors.	INF_{ijt}
H2	The propensity to use the equity method increases with the number of years that the shares have been held.	DUR_{ijt}
H3	The propensity to use the equity method increases with the size and the growth of the investment.	$\gamma_{ijt}, \Delta\gamma_{ijt}$
H4	The propensity to use the equity method is higher if the investor and the investee are in the same industry.	$\chi(IND_{ij})$
H5	The propensity to use the equity method in the current year is higher if it was used last year, provided the investment is still in the 20–50% range.	$\chi(E_{t-1})$
H6	The propensity to use the equity method increases with its impact on the investor's reported earnings.	δ_{it}
<i>Industry practice</i>		
H7	The propensity to use the equity method varies across industries.	IND_i

The table summarizes the conjectures made in Section 3. The labels in the left column are used for later reference to a specific hypothesis. The variables in the right column are empirical proxies, which are defined in Section 4. γ_{ijt} is the fraction of voting equity held by investor i in investee j at time t . $\Delta\gamma_{ijt}$ is the difference between the fraction of investee j held this year and last year. INF_{ijt} is the voting equity in investee j held by investor i relative to the voting equity held by the largest of the remaining owners. DUR_{ijt} is the number of years up to and including time t that the investment is at least 19%. $\chi(IND_{ij})$ equals one if firms i and j are in the same industry, and zero otherwise. $\chi(E_{t-1})$ equals one if the equity method was used last year, and zero otherwise. δ_{it} is the percentage change in the investor's reported earnings if the equity method rather than the cost method is used for all 20–50% investments. IND_i is a vector of indicator functions identifying the industry of firm i .

Hypothesis 5: The propensity to use the equity method in the current year is higher if it was used last year, provided the investment is still in the 20–50% range.

Like the U.S. GAAP, the N GAAP include the criteria of materiality and intent. In our setting, *materiality* means that to justify the extra preparation costs of reporting by the equity method rather than the cost method, the effect of the equity method on the investor's total earnings should be nontrivial.⁶ Moreover, the materiality criterion does not apply to each individual investment, but only to the aggregate effect of using the equity method on all the firm's 20–50% investments.

Hypothesis 6: The propensity to use the equity method increases with its impact on the investor's reported earnings.

The principle of *intent* implies that the criteria of significant influence, strategic importance, and long-term commitment should be based on forward looking variables

⁶ The cost method relies only on the dividend received and the historic cost of the investment. The equity method requires detailed information about the investee's net income, write-offs of net excess value and goodwill, and intercorporate transactions between investor and investee. PricewaterhouseCoopers estimates that the marginal preparation cost of the equity method for large Norwegian firms in 1999 was NOK 440,000 in the switching year and NOK 210,000 thereafter. Vårdal (1986) suggests that an impact below 3% is immaterial, whereas an impact above 10% is material. The intermediate cases should be determined on a case-by-case basis.

rather than current or historic ones. We postpone the operationalization of this property until Section 4.

Watts and Zimmerman (1986, 1990) argue that even if the overall GAAP are given, the set of accepted accounting-method alternatives may still vary across *industries*. For instance, manufacturing firms may use the equity method quite frequently simply by custom, whereas shipping firms may do so very seldom. Such differences may be due to accounting practices that are shaped by conformity pressure from industry organizations, or simply by a long-lived industry tradition. Although such norms are neither legally binding nor stated in the GAAP, they may still influence the manager's choice of accounting method. We therefore control for industry-specific accounting choice by stating.

Hypothesis 7: The propensity to use the equity method varies across industries.

Table 1 summarizes our predictions and names the variables that will be used to measure the theoretical constructs in the empirical tests. The proxies are further explained in Section 4.

4. Methodology

We define a *consolidator* as a firm that chooses to account for an intercorporate investment by the equity method. Conversely, a *nonconsolidator* uses the cost method. To analyze if a firm's consolidation decision complies with the N GAAP, we specify the following model:

$$P(\text{CHO}_{ijt} \in A) = g(\beta_0 + \beta_1 \text{INF}_{ijt} + \beta_2 \text{DUR}_{ijt} + \beta_3 \gamma_{ijt} + \beta_4 \Delta \gamma_{ijt} + \beta_5 \chi(\text{IND}_i) + \beta_6 \chi(E_{t-1}) + \beta_7 \delta_{it} + \beta_8^T \text{IND}_i + \varepsilon_{it}) \quad A = E, C \quad (1)$$

where CHO_{ijt} is the accounting choice made by investor i for its investment in investee j at time t . The available alternatives are to use the consolidating equity method, E , or the nonconsolidating cost method, C . INF proxies for influence, and DUR reflects the long-term nature of the investment. The variables γ , $\Delta \gamma$, and $\chi(\text{IND})$ proxy for strategic importance, $\chi(E_{t-1})$ measures whether the equity method was used in the preceding period, δ reflects materiality, and the vector IND controls for industry-specific variations in the set of accepted accounting principles. We next discuss each of these variables in more detail.

Influence (H1). The best measure of influence is probably the fraction of the board seats controlled by the investor. As this information is not available, and also because the GAAP make specific references to voting equity, we use:

$$\text{INF}_{ijt} = \min_{k \neq i} \left\{ \frac{\xi_{ijt}}{\xi_{kjt}} \right\},$$

where ξ_{ijt} is the voting equity held by intercorporate investor i in firm j at time t . As the minimum is taken over all remaining investors, INF_{ijt} is the investor's voting power relative to the power of the most influential of the remaining investors. This definition captures the GAAP criterion that an investee can only be an associated firm if there are no other

influential investors (Norwegian Accounting Standards Board, 1991; Oslo Stock Exchange, 1986).

DURation (H2) is measured as the number of consecutive years up to and including time t that the investment has been 19% or higher (period t_1).⁷ Alternatively, we may appeal to rational expectations and use the remaining duration (t_2), which is the number of consecutive years from time $t+1$ until the investment drops below 19%. As t_1+t_2 is constant over time for a given investment, the alternative duration measure t_2 is just this constant minus t_1 . The effect on the regression of using t_2 rather than t_1 will therefore be negligible. We disregard years where the investment is below 19% to ensure we use a time period in which the investment is large enough to potentially be classified as strategic by the GAAP. None of our results change significantly if we choose a slightly higher lower limit, for example 20%, or use t_2 instead of t_1 .

Size of the investment (H3), γ_{ijt} . This measure of strategic importance is the fraction of outstanding shares held by the investor.

Change in the investment (H3), $\Delta\gamma_{ijt} \equiv \gamma_{ijt} - \gamma_{ijt-1}$, is the current year's change in the fraction of equity held.

Related operations (H4), $\chi(\text{IND}_{ijt})$, is the third proxy for strategic importance. As our partitioning of industries according to IND is quite coarse, we expect firms with different IND to have unrelated operations. The indicator function $\chi(\text{IND}_{ijt})$ is equal to one if the two firms are in the same industry and zero otherwise.

Previous consolidation (H5), $\chi(E_{t-1})$. The N GAAP state that if an investment was consolidated last year, it should be consolidated this year, if the influence is still significant. We capture this time-consistency rule by the indicator function $\chi(E_{t-1})$, which is unity whenever this criterion is met, and zero otherwise.

Materiality and intent (H6): To control for materiality, we include the consolidation impact ratio

$$\delta_{it} \equiv \left| \frac{\sum_j \Delta \text{EC}_{ijt}}{\text{Profits before taxes under the cost method}_{it}} \right|$$

where ΔEC_{ijt} is our estimate of the effect on investor i 's earnings of using the equity method rather than the cost method, for investee j at time t .⁸ We assume that intent is stronger the higher the time t values of INF, DUR, γ , and δ .

⁷ The reason we use 19% rather than 20% is explained in Section 5.

⁸ Let EM_{ijt} be the effect on investor i 's earnings by accounting for investee j by the equity method at time t , and let CM_{ijt} be the effect when using the cost method. The net effect of using the equity method rather than the cost method is $\Delta \text{EC}_{ijt} \equiv \text{EM}_{ijt} - \text{CM}_{ijt}$. The effect on consolidated earnings of using the equity method is $\text{EM}_{ijt} = \gamma_{ijt} \text{ANI}_{ijt}$, where ANI_{ijt} is the adjusted net income in investee j at time t , which corrects for intercorporate transactions and for write-offs of net excess value and goodwill. Due to missing data, write-offs of net excess value and goodwill are set to zero, biasing our estimate of ANI upwards. We approximate intercorporate transactions by the intercorporate dividend. Since the effect of the cost method is $\text{CM}_{ijt} = \gamma_{ijt} \text{DIV}_{ijt}$, it follows that $\Delta \text{EC}_{ijt} = \gamma_{ijt} (\text{NI}_{ijt} - 2\text{DIV}_{ijt})$, where DIV_{ijt} is the intercorporate dividend, and NI_{ijt} is the net income of investee j .

INDustry (H7). We use the UN international classification standard ISIC to assign firms to industries. When firms are in several industries, we select the industry, in which the largest number of the firm's affiliates is operating.⁹ We restrict the classification to the first ISIC digit, as finer partitions are ruled out by the sample size. In addition, H4 is valid only for coarse partitions. The industry proxy IND_i^n enters as a dichotomous variable, taking on the value of one if firm i is from industry n and zero otherwise. We set $IND^0 \equiv 0$ and define the industry proxies as:

Index value (n)	ISIC group	Industry
0	2; 5	Petroleum drilling and production
1	3	Manufacturing
2	7	Shipping
3	8.3	Real estate
4	8.1	Finance and banking
5	8.2	Insurance

Numbers zero through five refer to superscripts of IND , such that IND_i^4 is the financials dummy. Since the real estate and insurance industries contain only one firm each, $IND^{3,5}$ is used as a joint category. IND_i is the vector of the five industry dummies, and $\beta_{8 \times 11}^T = (\beta_{81}, \dots, \beta_{111})$ is the transpose of the vector of industry coefficients.

5. Sample selection and descriptive statistics

5.1. The sample

Our sample consists of firms where both the investor and the investee are listed on the OSE during the years 1986–1994.¹⁰ The ownership data relate to the end of the calendar year, which also ends the fiscal year. To be included in our sample, the investor must have group financial statements, and the investment of interest must be in the range $0.19 \leq \gamma_{ijt} < 0.50$. All such investments are included whether they are accounted for by the equity method or the cost method. We use the lower limit of 19% because the population of potential equity method users is difficult to quantify. As discussed in Section 2, a firm can use the equity method when $\gamma_{ijt} < 0.20$ if it exerts significant influence. One firm in our sample actually consolidates a fraction that is marginally below 20% (19.9%) in two consecutive years.¹¹

⁹ We could alternatively assign a firm to its largest industry as measured by market values. Since major parts of a conglomerate are often not listed, this approach is infeasible.

¹⁰ Investments in nonlisted firms are excluded due to missing data on ownership structure and the market price of equity.

¹¹ One might argue that 19.5% is a more logical lower bound, since this is the lower decimal limit for rounding off to 20%. Using 19.5% instead of 19% reduces the sample size by just three observations, and there is no effect on any of our results. Similarly, using 20% as a lower bound has no substantive effect.

Data were partly obtained from electronic sources, and partly hand-collected from annual reports. All firms were asked to supply information missing from these sources. Using the restrictions that $0.19 \leq \gamma_{ij} < 0.50$ and that the investor is fully consolidating at least one subsidiary, the population contains 161 firm-year investments. There are 46 distinct investors and 69 distinct investees, implying that the average investor listed on the OSE holds a 19–50% equity stake in 1.5 other OSE firms.

As of 1994, the average market cap per OSE firm is roughly 1.8 times the average NASDAQ firm and 0.2 times the average NYSE firm. Although market cap roughly doubled over the sample period, the OSE is small by international standards. According to 1994 year-end estimates, the OSE ranks 12th among the 17 European countries from which comparable data is available (Federation Internationale des Bourses de Valeurs 1995).

Investors in our sample represent about 40% of the total OSE equity-market capitalization, and the average investor is about four times larger than the investee. Manufacturing, shipping, and finance firms hold disproportionately many intercorporate investments between 19% and 50%, whereas manufacturing and shipping are also overrepresented among the investees. These two industries account for 70% of the investors, while finance represents one fifth.

5.2. Consolidation policy under the N GAAP

Panel A of Table 2 shows that the mean fraction of actual to potential users of the equity method is 39%. There is an increasing tendency to use this method, as the fraction shifts abruptly in 1990 from about 25% to approximately 50% thereafter. For instance, while 28% of the investments are consolidated in 1988, half of them are in 1994.¹² Panel B breaks the sample down according to the equity fraction held. Seventeen of the one hundred sixty-one investments are between 19% and 20%, and fifteen of them probably do not have the option to use the equity method. The extra noise from including these cases should have a negligible effect on our findings.

The N GAAP state that an investment should be consolidated if the investor considers it a long-term commitment (H2). Panel A of Table 3 shows the summary statistics for investment duration, that is, the number of consecutive years that the investments in our sample have been strictly positive. The duration of the subsample of these investments that are actually consolidated is shown in Panel B. To ensure that long-term commitment is estimated with minimal error, we use 1980 rather than 1986 as the start of the measurement period. This means that the minimum and maximum duration of an investment is 1 and 15 years, respectively. The main impression from Panel A is that large investments between OSE firms are short-lived. Seventy-eight percent of them last

¹² As this paper studies compliance with the accounting standard rather than the adoption of one of the two methods specified by the standard, we will not analyze why the propensity to use the equity method changes over time. Nevertheless, when relating the scores on the equity-method criteria to the actual adoption of the method in Section 6, we will account for a potential shift in the interpretation of the GAAP in 1990.

Table 2
The fraction of Oslo Stock Exchange firms using the equity method to account for intercorporate investments between 19% and 50%, 1986–1994

	Sample size	Fraction of firms using the equity method
<i>(A) By year</i>		
1986	32	0.13
1987	23	0.35
1988	18	0.28
1989	17	0.12
1990	18	0.56
1991	13	0.46
1992	16	0.56
1993	14	0.57
1994	10	0.50
Mean (S.D.)	17.89 (0.17)	0.39
Median	17.44	
<i>(B) By fraction of equity held</i>		
$0.19 \leq \gamma < 0.20$	17	0.12
$0.20 \leq \gamma < 0.30$	69	0.33
$0.30 \leq \gamma < 0.40$	34	0.44
$0.40 \leq \gamma < 0.50$	41	0.41
Mean (S.D.)	40.25 (0.15)	0.33
Median	37.5	
Total	161	

Panel A shows the number of observations by year, where the middle column is the total number of 19–50% investments. The right column shows the fraction of these investments accounted for by the equity method rather than the cost method. Panel B classifies the sample by the fraction of equity held (γ).

Table 3
The duration of intercorporate investments between 19% and 50%, and the corresponding duration of equity method use, for firms listed on the Oslo Stock Exchange, 1986–1994

	Duration (years)											Total	Mean	Median	S.D.
	1	2	3	4	5	6	7	8	9	13	15				
<i>(A) Duration of the investment (years)</i>															
Number of cases	21	15	9	2	2	1	2	1	2	2	1	58	3.16	2	3.22
Rel. freq.	0.36	0.26	0.16	0.03	0.03	0.02	0.03	0.02	0.03	0.03	0.02	1.00			
<i>(B) Duration of the equity method (years)</i>															
Number of cases	15	9	5	2	0	0	0	0	0	0	0	31	1.81	2	0.95
Rel. freq.	0.48	0.29	0.16	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00			

The duration of the investment is the number of consecutive years during 1980–1994 that the investment is strictly positive, provided the investment is at least once in the 19–50% range. The duration of the equity method is the number of years that the investment is accounted for by the equity method. Panel A shows the relative frequency distribution of the investment's duration, regardless of whether the investment is accounted for by the cost method or the equity method. Correspondingly, Panel B shows the duration of the equity method. The mean, median, and standard deviations are weighted by relative frequency, which is the number of observations of that duration divided by the total number of observations.

less than 4 years, and the mean and median duration is 3.2 and 2 years, respectively.¹³ Panel B shows that the average consolidation period is roughly half the average investment period: 1.8 and 3.2 years, respectively. No consolidation lasts longer than four years, and 93% of them do not survive three years.

These results are surprising because the N GAAP strongly recommend that investments with significant influence be consolidated if they are strategic (H3 and H4) and *long-term* (H2). Based on Panel A alone, the short investment periods may suggest that most of these investments are not strategic. However, not all of them have a short life, and the critical issue is the relationship between duration and accounting-method choice rather than absolute duration alone. By relating the figures in Panels A and B, however, we find an inverse association between the duration of an intercorporate investment and the tendency to account for it by the equity method (the correlation is $-.62$). The observed accounting practice seems to be at odds with the N GAAP.¹⁴

The same impression is given by Table 4, which shows how the relevant investment characteristics specified by the GAAP differ across users of the equity method and the cost method. The average duration (DUR) of the investment in the second row is marginally longer for the cost method than for the equity method (3.13 vs. 3.11 years), but the difference is not significant ($t = -0.04$). The same is true for the investor's influence over the investee (INF). As for strategic importance, the average value of two of the three proxies (γ and $\Delta\gamma$) are consistent with our hypotheses that investments accounted for by the equity method are larger and grow more. The third proxy [$\gamma(\text{IND})$] is not consistent, as our sample firms use the cost method more often when the investor and the investee are in the same industry. However, like for the two other proxies of strategic importance, this difference is statistically insignificant.

The table shows that investors generally adhere to the time-consistency criterion [proxied by $\gamma(E_{t-1})$], as the equity method is used significantly more often by investors who used the equity method the previous year (H5). Time consistency is the only GAAP criterion that differs significantly between users of the equity method and the cost method at conventional levels of significance.

¹³ Similar results are reported by Böhren and Norli (1997), who analyzed every intercorporate investment between OSE firms in 1980–1994, regardless of size (10,189 holdings altogether). They find that duration tends to be short (1.74 years on average) and somewhat longer for large holdings than for small. The typical intercorporate investment is small, as the mean (median) fraction is 2.8% (0.4%), and 82% of the holdings are below 5%. Böhren and Norli (1997) find that intercorporate investments can be explained as activities in the market for corporate control, as a source of financial slack for growing firms that want to reduce adverse selection costs in the market for new security issues, and as a buffer in the investor's liquidity management system.

¹⁴ There is a potential truncation bias in our sample. Table 3 implicitly assumes that investments in 1980 start that year, and that investments in 1994 end that year. Still, the table indicates that the bias is negligible, as both the investment period (Panel A) and the consolidation period (Panel B) are very short relative to the period 1980–1994. To formally check this, we excluded all investments that are positive in 1980 or 1994 when estimating the investment's duration. As expected, the results are practically unchanged. For instance, when removing investments that are positive in 1994 (1980), the number of 1-year durations in Panel A decreased from 21 to 19 (21). Durations of 2 years decreased from 15 to 13 (15). The number of consolidations in Panel B that last 1 year decreased from 15 to 13 (15), while the number of 2-year consolidations decreased from nine to seven (five). The correlation coefficient between the duration of the investment and use of the equity method changed from $-.62$ to $-.60$ ($-.56$).

Table 4
Investment characteristics by accounting method for firms listed on the Oslo Stock Exchange, 1986–1994

Investment characteristic	Equity method				<i>t</i>	Cost method			
	<i>N</i>	Mean	Median	Standard deviation		<i>N</i>	Mean	Median	Standard deviation
INF	51	2.66	2.01	1.78	−0.19	80	2.74	2.47	2.76
DUR	57	3.11	2.00	3.53	−0.04	104	3.13	2.00	3.04
γ	57	0.33	0.36	0.10	1.37	104	0.31	0.28	0.10
$\Delta\gamma$	57	0.12	0.01	0.17	0.32	104	0.11	0.04	0.16
$\chi(\text{IND})$	33	0.44	0.00	0.50	−0.45	61	0.57	1.00	0.50
$\chi(E_{t-1})$	57	0.44	0.00	0.50	7.96	104	0.02	0.00	0.14
δ	47	0.27	0.04	0.51	−1.12	78	0.50	0.06	1.57
$S(t)$	57	0.67	1.00	0.48	4.48	104	0.32	0.00	0.47

The table reports means, medians, and standard deviations of investment characteristics that are relevant according to the GAAP for choosing between the equity method and the cost method. Simple averages are computed across all observations, except for industry closeness [$\chi(\text{IND})$] and earnings impact (δ). The former is constant over time for a given investment, while the latter is constant across investments for a given investee. Simple averages for these two variables are computed only across the dimensions in which they vary. *N* is the number of observations of the investments' characteristics, and the *t* is the *t* statistic for difference in means.

INF is the voting equity held in an investee relative to the equity held by the largest of the remaining owners. DUR is the number of consecutive years up to and including the current year that the investment is at least 19%. γ is the fraction of voting equity held by the investor in the investee. $\Delta\gamma$ is the difference between the fraction held this year and last year. $\chi(\text{IND})$ equals one if the investor and the investee are in the same industry, and zero otherwise. $\chi(E_{t-1})$ equals one if the equity method was used last year, and zero otherwise. δ is the absolute value of the percentage change in the investor's reported earnings if the equity method had been used instead of the cost method. $S(t)$ equals one if the current year is 1990 or later, and zero otherwise.

It may still be argued, however, that the time-consistency rule can easily be bypassed without formally violating the GAAP. An owner who used the equity method last year may reduce the investment to slightly below 20% this year, and thereby switch to the cost method. We explore this possibility by analyzing a consolidation policy for investments around the lower qualification limit. Table 5 shows the time pattern of 11 intercorporate investments that are accounted for by the equity method at least once and that are also at least once between 19% and 22% during the sample period. The first two cases are consistent with the notion that firms marginally adjust the investment downward to escape the consolidation requirement. Cases three through eight do not fit such an explanation, whereas cases nine and ten violate the time-consistency criterion. Overall, there is no obvious indication that marginal adjustments in investments are widely used to bypass the accounting standard.

5.3. Industry-specific accounting practice

As discussed in Section 2, the accounting norms of the industry may influence the accounting-method choice in ways not dictated by the GAAP (H7). The propensity to consolidate in our sample does indeed vary substantially across industries. The equity method is widespread in manufacturing (52% of the firms), and hardly used at all in real estate (0%), finance (11%), and insurance (0%). The petroleum and shipping industries are in between these extremes (14% and 31%, respectively). This finding strengthens our prior

Table 5

Dynamics of intercorporate investments between 19% and 22% for firms listed on the Oslo Stock Exchange, 1986–1994

Investment ^a	Fraction owned (%)								
	1986	1987	1988	1989	1990	1991	1992	1993	1994
1	16.4	20.2 ^c	18.7	19.5	14.5	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	20.0 ^c	29.8 ^c	19.5	0.0	0.0	0.0
3	27.4	20.5 ^c	0.0	0.5	0.0	0.2	0.0	0.0	0.0
4	20.8 ^c	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	20.8 ^c	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.6	20.0 ^c	20.0 ^c	14.0	2.3	2.3	2.3	2.3	2.2
7	0.0	0.0	20.0 ^c	0.0	2.6	2.6	2.6	2.6	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	20.5 ^c	33.4 ^c	32.0 ^c
9	21.1 ^c	21.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	18.3	20.2 ^c	20.0	0.0	0.0	0.0
11	0.0	0.0	0.0	24.5	14.5	19.3	20.5 ^c	20.5 ^c	0.0

The table shows the time pattern of investments that include at least one holding in the 19–22% range over the sample period, and that are accounted for by the equity method at least once. Investments that are accounted for by the equity method in a given year are superscripted “e” that year.

^a Investments 5–7 belong to the same owner.

belief of a systematic variation in the accepted set of accounting principles across industries.

6. Statistical tests

When analyzing the multivariate relationship between investment characteristics and accounting-method choice, we express Model (1) as a dichotomous logit model. To account for the increasing propensity to consolidate from 1990 onwards documented by Tables 2 and 4, we include the shift variable $S(t)$, which is zero for $t < 1990$ and one otherwise. The conditional probability that investor i accounts for investee j at time t with the equity method, $P(E) = 1 - P(C)$, is given by:

$$P(E) = \frac{\exp(\beta^T \mathbf{x}_{it})}{1 + \exp(\beta^T \mathbf{x}_{it})}, \quad \beta, \mathbf{x}_{it} \in \mathbb{R}^{13}$$

(2)

The vector \mathbf{x}_{it} contains the constant 1, the seven regressors discussed in Section 4 [INF, DUR, γ_{ijt} , $\Delta \gamma_{ijt}$, $\chi(\mathbf{IND}_{ijt})$, $\chi(E_{t-1})$, δ_{ijt}], the four industry dummies (\mathbf{IND}_i ; recall that $\mathbf{IND}^0 \equiv 0$), and the time dummy $S(t)$. The β is the corresponding vector of 13 coefficients to be estimated.

According to our hypotheses summarized in Table 1, an increase in any of the GAAP related regressors in Model (2) increases the propensity to choose the equity method instead of the cost method. Consequently, we predict a positive sign for the corresponding coefficients, whereas the signs of the dummies representing industry specific accounting practice are indeterminate. We show the maximum likelihood estimate of Model (2) in

Table 6. The regression is based on a subsample of 131 observations due to missing observations of INF.¹⁵

Panel A compares the log likelihood of the estimated model to a restricted version that only fits the intercept term. As the restricted model forces all coefficients except β_0 to equal zero, every investment is assigned the same probability of being accounted for by the equity method, regardless of individual investment characteristics. The estimated β_0 will be such that the probability of any investment being accounted for by the equity method equals its actual frequency in the sample firms. The χ^2 statistic shows that the full model outperforms such a restricted alternative at a significance level below 1%.

Panel B shows maximum likelihood coefficients for the unrestricted model. The results can be summarized as follows, using 5% as the significance level.¹⁶ First, there is no significant association between relative voting power and accounting-method choice, suggesting that managers do not comply with the fundamental consolidation criterion of significant influence (H1). Second, neither is long-term commitment a determinant, as the investment period has no significant influence on the accounting choice (H2).¹⁷ Third, strategic importance is irrelevant as well. Although neither the size nor the recent growth of the investment has a statistically significant impact (H3), the signs of the coefficients are as predicted. Fourth, the tendency to use the cost method increases significantly if the investee belongs to the investor's industry, which is contrary to our prediction (H4).¹⁸

The materiality criterion receives no empirical support (H6). The only part of the N GAAP that is generally observed in practice is the time-consistency rule. There is a significant tendency for an investment that was accounted for by the equity method last year to be accounted for by that the same method this year as well (H5).

We next use Model (2) to predict whether a given investment will be reported by the equity method or the cost method. The estimated parameters from Panel B and a given investment's unique characteristics (i.e., the values of its independent variables) are used to estimate the probability that either accounting alternative will be chosen. The equity method is predicted whenever this estimated probability exceeds .5.

According to the bottom row of Panel C, our prediction model is correct in 82% of the 131 cases. To evaluate this hit ratio, the model may first be compared with an uninformed

¹⁵ The ownership-structure data used to construct INF is based on voluntary information provided in annual reports. After having contacted all the firms with insufficient data to estimate INF, we are still forced to leave out 30 of the 161 cases. We have no reason to suspect that the firms with missing ownership data differ systematically from the others in their tendency to comply with the N GAAP.

¹⁶ Multicollinearity does not seem to inflate the *P* values. First, pairwise correlations are moderate, except for the pair (γ , INF), where the Pearson product-moment correlation is .5. Still, this is well below the rule-of-thumb critical limit of 0.8 (see, for instance, Greene, 1993). Second, the inverse correlation measures how well a regressor *i* can be represented as a linear combination of the remaining regressors. It is defined as $(1 - R_i^2)^{-1}$, where R_i^2 is the coefficient of determination from said regression. DUR is the variable that can best be represented in this fashion, with an inverse correlation of 2, that is, $R_{DUR}^2 = .5$. This is also comfortably below the critical limit.

¹⁷ We inferred from Tables 3 and 4 that an investment's duration is negatively associated with the propensity to consolidate. The multivariate test in Table 6 reveals that this relationship is neither robust nor significant once we control for the impact of the remaining determinants.

¹⁸ One possible explanation is that when firms make strategic investments in other firms, they primarily build conglomerates. This means investing in firms that are outside the investor's core industry.

Table 6

Estimation of the N GAAP compliance Model (2) on a subsample of intercorporate investors listed on the Oslo Stock Exchange, 1986–1994

(A) Likelihood ratio				
Model		-Log likelihood	$\chi^2 (P>\chi^2_{12})$	N
Unrestricted		54.65	65.14 (0.00)	131
Restricted, $(\beta_1, \dots, \beta_{12})=0$		87.57		131
(B) Parameter estimates				
Source	Predicted sign	Coefficient	Likelihood ratio	P value
Intercept		-1.80		
INF	+	-0.07	0.34	0.56
DUR	+	0.05	0.19	0.66
γ	+	1.98	0.28	0.60
$\Delta \gamma$	+	2.14	1.15	0.28
$\gamma(\mathbf{IND})$	+	-1.17	4.80	0.03
$\gamma(E_{t-1})$	+	3.41	23.90	0.00
δ	+	-0.83	3.22	0.07
IND ¹		1.05	0.72	0.39
IND ²		0.15	0.01	0.91
IND ⁴		-1.37	0.78	0.38
IND ^{3,5}		-6.87	0.38	0.54
$S(t)$	+	0.66	1.75	0.19

(C) Hits of predicted consolidation policy

CHO	Number of actual CHO	Number of hits	Fraction hits
<i>E</i> (equity method)	51	34	0.67
<i>C</i> (cost method)	80	73	0.91
<i>EUC</i> (all)	131	107	0.82

Based on a subsample of 131 investments between 19% and 50%, the table shows statistics of the logit regression evaluated at

$$\beta^j \mathbf{x}_{ijt} = \beta_0 + \beta_1 \text{INF}_{ijt} + \beta_2 \text{DUR}_{ijt} + \beta_3 \gamma_{ijt} + \beta_4 \Delta \gamma_{ijt} + \beta_5 \gamma(\text{IND}_{it}) + \beta_6 \gamma(E_{t-1}) + \beta_7 \delta_{ijt} + \beta_8 \gamma_{t-11}(\text{IND}_{it}) + \beta_9 S(t)$$

The log-likelihood ratio is reported in Panel A, the parameter estimates of the unrestricted model are in Panel B, and the actual versus predicted accounting-method choice is shown in Panel C.

INF is the voting equity held in an investee relative to the holdings of the largest of the remaining owners. DUR is the number of consecutive years up to and including the current year that the investment is at least 19%. γ is the fraction of voting equity held by the investor in the investee. $\Delta \gamma$ is the difference between the fraction held this year and last year. $\gamma(\text{IND})$ equals one if the investor and the investee are in the same industry, and zero otherwise. $\gamma(E_{t-1})$ equals one if the equity method was used last year, and zero otherwise. δ is the absolute percentage change in the investor's reported earnings if the equity method had been used instead of the cost method. $S(t)$ equals one if the current year is 1990 or later, and zero otherwise.

Likelihood ratios are χ^2_1 distributed. Critical values at the .10 and .01 levels are 2.71 and 6.63, respectively. Degrees of freedom in the log-likelihood ratio equals the number of restricted parameters, which is 1×12 . The χ^2 statistic is computed as $-2(\ln L_{\text{restr.}} - L_{\text{unrestr.}})$, where L is the log-likelihood function.

prediction that simply assigns the same probability to both methods. Such a model would be correct in half of the cases, which is clearly inferior to our model. A more demanding alternative is a prediction rule based on the actual fraction of investments accounted for by the equity method in our sample, which is 39% (from column 2 of Panel C). If one knows this ratio, but has no firm-specific information about each individual investment's score on the GAAP criteria, such a model would predict that the cost method is the most likely alternative and, hence, the best prediction for each of the 131 cases. This rule would be correct 61% of the time, which, again, is less than the 82% hit ratio of our estimated prediction model. This finding is consistent with what we learned from the significant parameters in Panel B. Knowing the industry of the investee and whether it was accounted for by the equity method last year helps predict the accounting-method choice in the current year.¹⁹

7. Summary and conclusion

Compared with the United States and the E.U. countries, Norwegian GAAP give firms considerably more discretion on whether to account for intercorporate investments by the partially consolidating equity method or the simpler, nonconsolidating cost method. Once the investment satisfies the GAAP criteria of significant influence, strategic importance, and long-term commitment, adoption of the equity method is still voluntary by corporate law, although strongly recommended by regulators and enforceable by the OSE. Under such a flexible accounting standard, we ask to what extent the firm's accounting-policy decision produces the information intended by the regulators. We answer this question by analyzing whether intercorporate investors using the equity method are more influential, strategic, and long-term owners than investors using the cost method.

Our major finding is that a firm's score on the GAAP criteria is not systematically related to the firm's choice of accounting method. This means we do not find support for the hypothesis that the regulators' intent is reflected in the observed accounting practice. This noncompliance implies that a firm's external analysts cannot use the observed choice between the cost method and the equity method to infer the underlying characteristics of the investment as specified by the standard (influential, strategic, long term). In this respect, the flexible GAAP does not produce informative accounting statements.

Still, the observed reporting behavior may reveal valuable information of a different kind. First, under a flexible regime, rational owners will only use the reporting alternative with the highest preparation costs (the equity method) if it also produces an offsetting benefit. For most of our sample firms with high scores on the GAAP consolidation criteria (i.e., strong influence, strategic importance, and lasting commitment), the consolidation benefits are too small to justify the extra reporting costs. This means the firm's perceived net benefit of the equity method does not increase with increasing scores on the GAAP

¹⁹ To check for robustness, we tested a reduced regression model by removing any variable whose coefficient is insignificantly different from zero at the 10% level. The two significant coefficients of the full model retain their signs, and there are only minor changes in their absolute values.

consolidation criteria. Second, as noted in the Introduction, a natural extension of this paper's focus on compliance *per se* is earnings management, which asks whether other determinants than the GAAP are driving the accounting-policy decision. For instance, when exploiting the inherent flexibility of the standard, managers may choose the accounting method that maximizes reported earnings to extract private benefits from bonus contracts or choose the earnings minimizing alternative to reduce the firm's political costs. Therefore, the full story of how flexible accounting standards influence information production cannot be told until one also understands the link to earnings management. Considering the complexity of the earnings management problem and the opportunity offered by the regulatory framework to study compliance *per se* in a detailed way, we have chosen to ignore earnings management in this paper.²⁰

In a survey paper on the relationship between financial disclosure and stock prices, Healy and Palepu (1993) ask for more research on what type of accounting principles will facilitate the communication between the firm and the stock market. "For example, is communication more effective when standards are detailed but rigid, as in the United States, or is it more effective to have broad guidelines, leaving managers considerable reporting discretion?" (Healy & Palepu, 1993, pp. 8–9). Our findings suggest that flexible accounting standards may create noisy and confusing communication. This problem is further illustrated by the fact that Norwegian regulators are currently considering making the equity method mandatory for every firm that satisfies the formal consolidation criteria explored in this paper. Our analysis suggests that because these criteria will still be open to interpretation and judgment by the information provider, making the equity method compulsory once the flexible criteria are met will not solve the inherent communication problem of the GAAP.

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²⁰ Böhren and Haug (2003) study how firms use the cost/equity choice to manage earnings. They find that managers of firms do not use the flexibility of the GAAP to reap personal benefits or to signal revised expectations about the firm's future prospects. However, highly levered firms choose between the equity method and the cost method in a way that maximizes reported earnings, possibly to reduce political costs or the renegotiation costs of debt covenants.

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International managerial accounting research: A contracting framework and opportunities

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Abstract

The objective of this paper is to provide an international managerial accounting contracting-based framework that organizes a broad sample of published research and (based on that sample) identifies research opportunities. Organizations that operate in cross-border markets constantly face contracting challenges that arise because of different factor and product market characteristics. Accounting has a role in defining, implementing, monitoring, and negotiating the implicit and explicit contracts firms use in these markets. Thus, a useful framework for considering international managerial accounting research would incorporate different international market characteristics that impact the contracting role of firms. Using such a theoretical framework, this paper examines the role of managerial accounting by focusing on operating and strategic decisions that require knowledge transfer, decision-rights assignment, and decision-rights control within international organizations. © 2004 University of Illinois. All rights reserved.

Keywords: International; Managerial; Accounting; Framework; Review; Contracting

1. Introduction

Although the growth in international managerial accounting research over the last decade has been significant, there are no frameworks to organize this literature and help researchers identify opportunities to add to this body of knowledge. The objective of this paper is to create a framework based on contracting theory useful for organizing published research and identifying opportunities for research in international managerial accounting. Consistent with Gray, Salter, and Radebaugh (2001), we distinguish in our analyses

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between comparative international management accounting and management accounting at the multinational level of analysis. We focus here on the latter by examining research that investigates how accounting is used when multinational enterprises (MNEs) resolve problems that are unique to operating across borders (Gray et al., 2001, p. 46). We do not consider the descriptive literature that focuses on international comparisons of particular management accounting techniques such as transfer pricing, costing procedures, or performance evaluation without considering why these differences exist. Previous reviews of international managerial accounting research have been broad including both comparative and multinational cross-border operational research. These reviews have generally lacked an integrative theory that points toward opportunities for future research.

This paper proposes a framework that allows multiple uses of accounting information and procedures in contracting efforts that assign and partition decision rights, aid in decision making, and implement decision control. The contracting framework provides researchers with a means of understanding and studying many of the roles of managerial accounting in international organizations. In particular, we provide a categorization of research across international operating and strategic decision levels that are affected by the function of managerial accounting through partitioning decision rights and implementing decision control. The impact of key environmental factors on contracting and the resulting international operating and strategic decisions is an essential element in the general integrative framework. Finally, the proposed contracting-based framework points toward opportunities for research in international managerial accounting.

A framework for organizing management accounting literature could be based on a variety of existing paradigms. For example, scientific management (Taylor), the bureaucratic school (Weber), human resource theory (Maslow, Rickert, and Argyris), the decision-making school (Simon) and the political science school (Sleznick) provide alternative paradigms for considering management accounting issues (for overviews, see Narayanan & Nath, 1993; Perrow, 1986). Because managerial accounting spans both behavioral and organizational issues, any of these or other paradigms will provide insights about potential research opportunities (for a critical review of each of these frameworks, including a critique of economic theories, see Perrow, 1986).

No single paradigm or theory is likely to be complex or rich enough to provide an overview of the entire international management accounting research literature. However, compared to other potential paradigms, economic-based contracting theory provides a useful and widely accepted paradigm for predicting and explaining variation in the multiple roles and interrelatedness of accounting information across MNEs and time. We believe that contracting theory provides an effective perspective from which to develop a theoretical framework for organizing and understanding existing published research and for identifying opportunities for future research.

Based on the earlier works of Coase (1937), Hayek (1945), and Williamson (1975), Jensen and Meckling (1992) develop a theory concerning the economic determination of decision rights within the firm. They suggest that an important objective of the firm is to align decision-making rights with those who possess the best information to make the decision. However, because the decision maker's self-interest may not be congruent with the welfare of the firm, the economic framework calls for implementing decision controls via implicit and explicit contracts. Contracting theory implies that managerial accounting

plays an important role not only in providing information for decision making, but also both in the assignment of decision-making rights and in the subsequent process of controlling such decision rights (Fama & Jensen, 1983a, 1983b). Empirical evidence also suggests that various managerial accounting mechanisms help in the decision-rights assignment and control process. For example, Shields and Young (1993) used survey results to show that superiors use participative budgeting to reduce information asymmetries and allocate resources (i.e., decision rights). Merchant and Manzoni (1989, p. 549) interviewed profit-center managers and found that budget targets were used as a mechanism to allocate decision rights to effective managers.

This contracting framework of providing information, partitioning decision rights, controlling decision rights, and evaluating and rewarding the subsequent decisions is embedded in environmental factors (e.g., economic, political, and cultural) and used to examine how managerial accounting is used in MNEs. The contracting framework is employed within the context of diverse international (1) operating decisions (e.g., management control systems (MCSs), transfer pricing, and budgeting) and (2) strategic decisions (e.g., market choice, market mode of entry).

The paper proceeds as follows: the prevalence of decentralized decision rights within MNEs is examined in Section 2. Contracting theory, which serves as the economic theory on which this paper's framework is developed, is described in Section 3. Also discussed in Section 3 is the sampling technique employed to create a representative sample of published international managerial accounting research. The interrelatedness of key international environmental factors, implicit and explicit contracts, and resulting implications for future research are discussed in Section 4. Section 5 relates these contracts to common international operating and strategic decisions and identifies opportunities for future research. Finally, a conclusion follows in Section 6.

2. Decentralization of decision rights

As a result of the globalization process, decision making is far more decentralized, resulting in more widely allocated decision rights (Heely & Nersesian, 1993). Successful growth for modern MNEs requires that international operating affiliates take the appropriate actions to improve production, market share, and the company's product line. Because only the managers at the operating affiliate possess the necessary intimate awareness of the circumstances surrounding operating decisions, decision rights are typically allocated to those managers. Examples of such decentralization include the realization that while major capital expenditures and top management hirings remain as corporate headquarter decisions, day-to-day operational, marketing, and personnel decisions typically are made at the local level (Heely & Nersesian, 1993).

With many day-to-day decisions being made at the local level (e.g., by operating affiliates), management accounting systems must be flexible in their ability to create and communicate information within the firm. Decentralization across international borders means that management accounting systems must adapt to changing information needs that accompany changes in international decision-rights allocation and subsequent preferences and needs for decision-control mechanisms. Management accounting system

characteristics will differ, for example, on fulfilling the control function under various types of international market-entry modes and international environmental conditions (for examples, see Groot & Merchant, 2000; Nishimura, 1995). Because of the diversity of environmental variables across countries, organizational globalization imposes additional decision-rights assignment and control problems over and above those found in domestic firms (Gray et al., 2001). The following section discusses the contracting theory framework and its application to the arena of international managerial accounting.

3. Contracting framework

3.1. Decision rights allocation and control

Organizations are collections of resources. These resources coexist with a set of associated decision rights. Organizations engage in explicit contracts, particularly with those outside the organization that identify the specific types of decision rights that coexist with a particular resource. However, for other assets in an organization, explicit contracts do not exist that determine either who has the right to make decisions associated with that resource or the limits on those decisions. Implicit contracts (i.e., job descriptions, budget outcomes) frequently serve the purpose of identifying decision rights within the firm (for more detailed examples, see Brickley, Smith, & Zimmerman, 1996). Budgeting is considered an implicit contract because remedies for contract violations are not explicit. Managers of the organization engage in the ongoing process of implicit and explicit contracting to partition and control the decision rights associated with the organization's resources.

Hayek (1945) first identified the importance of knowledge in the decision-rights assignment problem. He argued that the economic problem of society is how to utilize differential individual knowledge such that the best use of scarce resources is obtained. Hayek suggested that decision rights be partitioned either through markets or contracts so that individuals with the most knowledge about the circumstances surrounding a resource make decisions about that resource. Unfortunately, for many decisions within organizations (and in particular cross-border strategic or operating decisions), information important for the decision is not possessed by the decision maker(s). As a result, firms engage in costly knowledge transfer from knowledge holders to decision makers. Knowledge transfer is an important role of accounting within firms. It seems clear that knowledge-transfer problems can be significant in cross-border operations. Contracting theory has extended Hayek's pioneering work by offering insights into the organization's knowledge transfer processes.

In addition to the knowledge-transfer problem, the contracting framework points to two other organizational problems faced by management: (1) allocation of decision rights across employees with differential knowledge and (2) control of decisions by motivating employees to make decisions that are in the best interest of the organization. In competitive equity markets, these problems are solved by alienability, meaning that decision rights are partitioned and controlled via the market mechanism (the stock holder bears the risk and reaps the profits of a decision to hold or sell). Within organizations,

however, top management must assign decision rights to employees with differing levels of knowledge. Once assigned, the proceeds associated with their decisions accrue to the organization rather than to the individual assigned the decision right. If the individual's interest in the decision outcome does not coincide with the owner's, there is a decision-control problem. Jensen and Meckling (1992, p. 265) state that organizations solve decision-rights assignment and control problems by

1. assigning decision-making responsibility to those agents who possess the necessary specific knowledge, or the necessary specific knowledge is transferred to those individuals who possess the decision-making responsibility; and
2. creating control systems that (a) provide measures of performance and (b) specify relationships between rewards and punishments and measures of performance.

This contracting framework shows how the cost (and in some cases the impossibility) of transferring knowledge encourages decentralization and how decentralization leads to rights assignment and control problems. In international settings, the knowledge distribution problems are more difficult because of environmental variables and because the resulting contracting space for control issues has larger boundaries.

3.2. Knowledge characteristics

A major determinant of the optimal degree of decentralization is the ability to efficiently transfer knowledge across agents within the organization to aid decision makers. Consider, for example, specific and general knowledge. General knowledge is widely held knowledge that is easily obtained by agents within the firm. Examples of general knowledge include market prices or general firm goals and objectives. Knowledge that might be considered general knowledge within a purely domestic firm, however, will not be considered general knowledge in many international settings. For example, general beliefs about how business should be conducted in one country do not typically hold true in other countries (for examples, see Borkowski, 1999; Nishimura, 1995). Thus, general knowledge in one country can become specific knowledge in an international setting.

Specific knowledge is the knowledge most relevant to the particular decision being made. For example, for a raw materials purchase decision, knowledge of appropriate suppliers would be relevant specific knowledge. Idiosyncratic information is one type of specific knowledge that is typically acquired as a by-product of producing other goods. Examples of specific idiosyncratic knowledge include knowledge of individual employee preferences, individual machine's peculiarities and productivity, underemployed resources, geographic or cultural peculiarities, etc. Specific and, in particular, idiosyncratic knowledge is more costly to transfer than general knowledge. Difficult information-transfer issues arise in firms when decisions require integration of specific, especially idiosyncratic, knowledge located in widely separated individuals. Globalization compounds this knowledge-transfer problem (Whitley, 1999).

Another form of specific knowledge is knowledge produced by assembling and analyzing idiosyncratic knowledge. Assembled knowledge includes information and analysis gained through experience. In a global setting, individuals who possess assembled

knowledge gained through experience in a variety of international business operations become very valuable to organizations (Stanek, 2000).

3.3. *Knowledge transfer, decentralization, and control*

Contracting theory suggests that organizations constantly face trade-offs between centralization, where poor decisions may result from inadequate information on the part of the decision maker, and decentralization, where costly control mechanisms are necessary to align the decision-maker's goals with the welfare of the firm. If the decision right is not assigned to the individual possessing the relevant specific knowledge, then costly knowledge-transfer mechanisms must be set-up to transfer this knowledge to the centralized decision maker. An example of a costly knowledge-transfer mechanism is the budgeting process. Budgeting attempts to transfer to top management the kind of assembled knowledge needed for strategic planning purposes. Firms devote enormous amounts of employee time and resources to assembling and analyzing the information necessary to create budgets. In international settings, communication of knowledge through the budgeting process becomes more difficult because of geographic dispersion, cultural and language barriers, and other technological issues (a widely cited illustration is the Daimler–Chrysler merger).

Environmental factors, such as technological sophistication, can have a significant impact on the two costs involved with the tradeoff between decentralization and control. For example, computers can reduce the costs associated with transferring certain types of information or implementing better control mechanisms, such as the monitoring of employee behavior and decisions. Alternatively, incompatible budgeting software can create technological barriers. Using the contracting framework described previously, the remainder of the paper examines the role of managerial accounting in knowledge transfer, decision-rights assignment, and decision-control issues in international firms.

3.4. *Sample selection*

Our review and analysis of published international managerial accounting research was constructed by surveying *The Accounting Review*, *Accounting, Organizations and Society*, *Journal of Accounting Research*, *Journal of Management Accounting Research*, *The International Journal of Accounting*, *Abacus*, *Journal of International Business Studies*, *Management Accounting Research*, and the *European Accounting Review* for qualifying articles during the years 1991–2001.¹ A qualifying article is defined as one that examines a cross-border decision making setting and the related role of managerial accounting. Thus, research articles that examined a managerial accounting issue within only one country or simply compared the usage of managerial accounting techniques between or among countries without theory about why differences exist were not included in our sample. We adopt this criterion to establish a reasonable boundary for our review and to

¹ We consider additional general review articles and books outside of this set of journals throughout the discussion when appropriate.

ensure that the included studies examine issues from a multinational perspective. In addition, other relevant manuscripts, such as books, were identified through keyword searches and included in the review.

This sampling procedure is not designed to produce an exhaustive review, but rather a representative sample of published international managerial accounting research. When combined with our theoretical framework and environmental variables, the representative sample allows us to identify and discuss those international managerial accounting areas that have received the majority of past research attention and areas that possess the greatest opportunity for future research.

4. Environmental factors and contracting for decision-rights assignment and control

Environmental factors impact the knowledge necessary for both operating and strategic decision making in international organizations. Fig. 1 displays a graphical representation of the environmental factors and their interdependent relationships. The functioning of the economy, the political and legal restrictions, culture, and infrastructure impact how

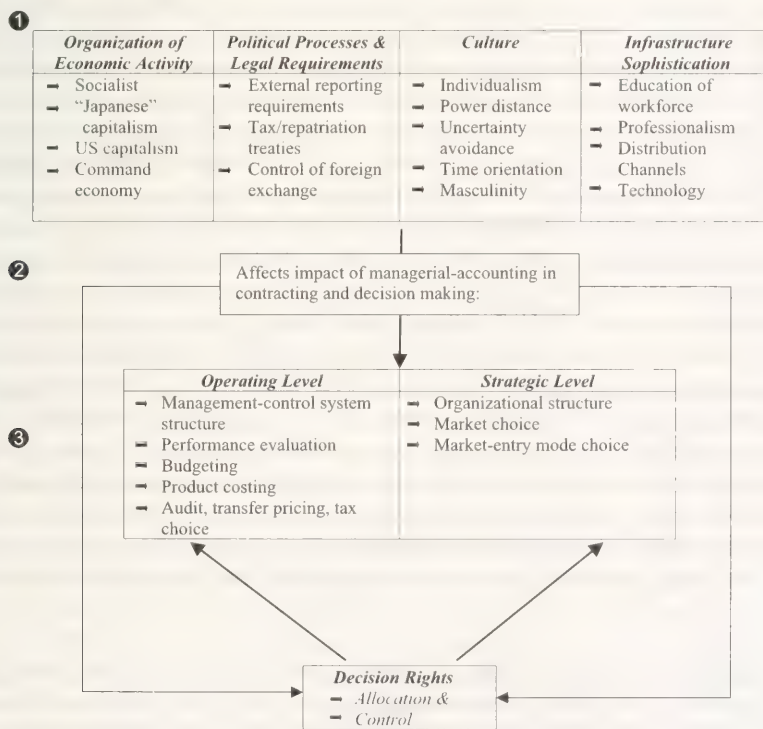


Fig. 1. Environmental factors and decision-rights allocation and control. Environmental factors [1] affect the MNEs contracting involving decision-rights allocation, and controls [2], which guide employees in making operating and strategic decisions [3].

managerial accounting systems are designed and used in contracting and ultimately affect organizational decisions.² Understanding the role and impact of management accounting in various international locations requires a consideration of environmental factors.

4.1. Environmental factors in international settings

Environmental factors can be categorized in four areas: the economy, the political and legal systems, culture, and a country's infrastructure. These categories are not independent. In fact, it should be clear that they are intractably intertwined. However, because extant literature uses these general categories (Gernon & Meek, 2001; Gray et al., 2001) and they provide a convenient framework for considering environmental characteristics of multiple countries, we also use them here.

4.1.1. Economy

Economies operate with a variety of structures. Participants in these economies have expectations that inform both implicit and explicit contracts that are made in these economies. For example, market choices have expanded recently to include numerous East bloc countries that formerly operated under socialist economic systems. Management accounting systems from former planned economy countries have significantly different orientations than those in capitalist countries (McDonald, 1993). Differences in decision-rights assignment and control in planned economies are evident in their management accounting systems. For example, employees in formerly planned-economy countries do not understand the profit motive driving business in capitalist economies. As a result, responsibility center designs taken for granted by a U.S. parent are difficult to impose in acquisitions or joint ventures (JVs) formerly operated under a planned economy. Accounting departments under planned regimes focus on collecting data on inputs and outputs and preparing statistical reports for the government. Firth (1996) showed that Chinese managers in organizations prior to a JV agreement had very few decision-making responsibilities. Firth also found a positive association between the adoption of accounting techniques in a Chinese JV and the extent to which the Chinese partner faces competitive markets.

Other examples of the impact of economic differences have been observed in countries such as Japan and Korea. In these countries, it is not uncommon for related firms to organize into a group called a chaebol or keiretsu. These groups of firms cooperate and help each other in many ways that are not typical in the United States and Europe. Jiang and Kim (2000) study the differences and resulting implication between U.S. corporate-governance approaches and Japanese approaches. They show that as the level of cross-corporate ownership increases (as used by keiretsu structures in Japan), there is less

² The contracting perspective used here, like other theories, has limitations in its ability to be universally descriptive. Contracting theory does not address why environmental forces such as political outcomes are enacted that affect management accounting practices. For example, the IRS requires arms length transfer prices between international subsidiary and parent, which in some cases has affected transfer-pricing's role in contracts internal to the firm (see Eden, Dacin, & Wan, 2001). Thus, contracting theory does not explain why or how political forces result in a particular legal restriction. However, it does provide a positive theory that describes how the organization might respond to a politically motivated environmental change.

information asymmetry between the firm and market participants. They imply that cross-corporate holdings discipline managers in the same way that corporate-governance procedures in the United States provide discipline.

It seems likely that international differences in the economic relationships among domestic firms are likely to impact contracting arrangements. Aulakh, Cavusgil, and Sarkar (1998) showed that the favorableness of the host country's economic environment was positively related to the use of royalties-based compensation (rather than lump sum) in licensing agreements. Anderson and Lanen (1999) studied the impact of the economic transition in India on the changes made to MCS in both domestic and international firms. They show that the 1991 liberalization of the Indian economy significantly impacted the use and importance of management accounting practices.

4.1.2. Political and legal

There are obvious connections between contracting and the political and legal systems in a country. In a poorly functioning legal environment (e.g., Russia in the late 1990s), contract enforcement is highly questionable. Kirsch, Laird, and Evans (2000) examined the role of the political and legal climate on market entry and growth strategies for professional services firms entering emerging markets. Kirsch et al. develop a conceptual model to illustrate the interrelationships among firm characteristics, the foreign environment, and the foreign subsidiary's structure. Unfortunately, the impact of legal and political environment on the specific role of management accounting systems in contracting has not been thoroughly explored. For example, little documentation is available about the relationship between subsidiary rights assignment and control and the parent or host country's political characteristics (McKinnon & Harrison, 1985).

International JV agreements provide a potential source of determining the importance of control-system characteristics in international operations (Groot & Merchant, 2000). If the details of the JV agreements could be categorized and correlated with host country and/or parent political characteristics, we could gain a better understanding of the driving forces behind decision-rights partitioning and control. Further, long-run analysis of the success of cross-border alliances in connection with these correlation studies could provide indications of successful management accounting procedures in international operations.

Political decisions about reporting requirements and taxes drive other differences in international management accounting practices. Although there is considerable research that compares external reporting requirement differences and their political causes, very little analysis documents the impact of these reporting differences on internal management accounting systems (for one example, see Choi & Levich, 1991). Research has shown that transfer-pricing practices are directly impacted by repatriation and tax structures (Collins, Kemsley, & Lang, 1998; Collins, Kemsley, & Shackelford, 1995; Cravens & Shearon, 1996). In addition, it seems likely that reward-incentive structures would differ due to politically determined personal taxation and repatriation policies. Researchers could generate evidence documenting these differences. Further, MNEs need to operate with numerous and varied incentive structures as a result of these tax and reporting issues. Evidence about the variety in incentive structure and their relationship to other management controls is not widely available from cross-border studies (for one exception, see Borkowski, 1999).

4.1.3. Culture

Preliminary research on the role of culture, particularly in implicit contracting situations, has been done (Chow, Shields, & Wu, 1999; Harrison & McKinnon, 1999). Societal values, such as individualism versus collectivism, power distance, uncertainty avoidance, etc., have been linked to accounting practices, such as authority of the accounting system, measurement practices, disclosure practices, etc. (Gray, Campbell, & Shaw, 1984; Merchant, Chow, & Wu, 1995; Perera, 1989). Results of these studies are inconclusive. Harrison and McKinnon (1999) review 15 years of culture-based MCS research. They document four major weaknesses of this research: (1) a limited view of the culture domain, (2) failure to consider intensity of cultural norms, (3) simplistic treatment of culture, and (4) overreliance on one conceptualization of culture (e.g., Hofstede, 1967). In particular, there is little acknowledgement that culture is intertwined with other environmental variables such as economic and political differences (Ueno & Sekaran, 1992). For example, the Japanese system of “guaranteeing” lifetime employment is often considered to be a cultural (collectivist) impact of the Japanese system. However, this lifetime employment policy would be difficult without the keiretsu economic system that allows flexibility in employment assignments.

Studying changes made in accounting systems when the parent integrates a newly acquired subsidiary might provide significant insight into the diffusion of management control practices (Firth, 1996). Documenting the historical evolution of the managerial accounting system as it matches the cultural, political, and economic factors in the subsidiary’s environment would provide a preliminary understanding of the impact of these unmeasurables on accounting systems. Anderson and Lanen (1999) used such an approach to consider the environmental changes in India over a 10-year period and the associated changes in management accounting systems.

Harrison and McKinnon (1999) call for new insights into the relation or distinction between national culture and firm culture. Western and Asian or Far Eastern (e.g., Japan) national cultures are very different. Western national cultures are relatively less collectivistic (more individualistic) and possess relatively weaker ties between family and company loyalty (e.g., lifetime employment with the same company). There is some evidence that management practices successful in Japanese firms, such as target costing, continuous cost improvement, or horizontal communication, are not as successful when implemented in Western firms. Theory suggests that the control function, fulfilled by Japan’s national culture (Nishimura, 1995), is missing in the West. The relation between national and firm culture and how it interacts with other environmental factors to affect the use of management accounting practices in contracting, such as making successful strategic and operating decisions, provides promise for future research.

4.1.4. Technology and infrastructure

Included under the infrastructure category are educational level and professionalism for potential employees, the physical infrastructure of the country, and the available technology. These are of particular concern in developing countries and former planned-economy countries. For example, eastern European countries did not have management education until the first advanced-degree program was established in Budapest in 1988. Thus, the available professional pool of managers is very low in these countries. Gray (1988)

proposes that professionalism among accountants is likely to be related to cultural dimensions. He hypothesizes that in countries where individualism is high and uncertainty avoidance and power distance is low, the professionalism of accountants will be stronger.

Physical infrastructure barriers can also create significant management accounting issues in cross-border operations. Logistical nightmares associated with shipping and transportation issues can create unforeseen delays and increased costs. Anderson and Lanen (1999) found that Indian firms contracted with domestic rather than international suppliers because of unreliable infrastructure considerations. Infrastructure issues also significantly influence market-entry decisions. For example, contracting choices among licensing, exporting, and creating a JV or a wholly owned foreign subsidiary may revolve around infrastructure, economic, or political issues. Designing accounting systems that identify and provide management with cost estimates that acknowledge international environmental costs presents significant challenges.

5. The framework for international managerial accounting research

For purposes of organizing the discussion of international managerial accounting research, the contracting framework outlined in Section 3 and expanded in Fig. 1 is used to classify the demand for managerial accounting into two categories, partitioning of decision rights and designing decision control. Fig. 2 provides an overview of the management accounting system choices firms make that are impacted by the environmental factors discussed in Section 4. The cells of Fig. 2 focus on the bottom two thirds of Fig. 1. To organize the diverse research across these two categories, the framework must capture the contracting impacts on decisions throughout various levels of the firm. A convenient and widely used categorization of types of decisions is operating- and strategic-level decisions. The columns in Fig. 2 show several types of decisions faced by international organizations. These decisions are classified into rows in Fig. 2 according to decision-rights management and control issues.

The international decisions identified in Fig. 2 and discussed in this section are not independent. Thus, management accounting knowledge is demanded across a variety of

	<i>Strategic Decisions</i>		<i>Operating Decisions</i>	
	Market-Choice Decisions	Entry-Mode Decisions	Employee Decisions	Cross-border Decisions
Partition Decision Rights	Differences in Abilities & Cultures Impact Specific Knowledge: Organize by line of business or geographic segments?	Export or Licensing vs. Joint Venture or Acquisition is Influenced by Firm-Specific Knowledge	Location of Specialized Expertise: Economic, Political and Cultural Knowledge of Markets	Cross-Border Transactions and Transfer-Pricing Responsibility
Design Decision Control	Political Risk, Financial Risk, And Economic Exposure: What type of control system is effective?	Desired Control over Firm-specific Knowledge: High Control—export or wholly owned Less Control—licensing or joint venture	Centralized or decentralized exchange-risk management? Budgeting process accountability for foreign exchange fluctuations?	Country level choice to be a net importer, net exporter, or purely domestic impacts responsibility accounting

Fig. 2. Global choices and decision-rights allocation and control.

international decision settings, and in addition accounting processes and practices fill a variety of roles.

Table 1 uses the theoretical framework illustrated in Figs. 1 and 2 to organize our sample of published international managerial accounting research. The rows in Table 1, panels A and B, reflect decision-rights allocation and decision-control contracting issues, respectively. The columns show several operating (panel A) and strategic (panel B) decision categories. These categories are examined in more detail in the following sections. The companion table, Table 2 in the appendix, provides a more detailed discussion of each of the published studies included in Table 1.³

The theoretical framework we use in this paper helps to explain conflicting results in the literature as well as suggest why firms might use managerial accounting practices differently in certain operating and strategic decisions.

5.1. Operating decisions

Operating decisions are often country specific. These decisions typically occur at local levels and are, by definition, made by lower-level employees (e.g., plant manager, subsidiary head, etc.). The choice of what is or is not an operating-level decision belongs to upper management because upper management usually possesses the associated decision rights. Operating decisions typically include the design of the local management control, performance evaluation, and product costing systems. The role of budgeting at the local level, as a means of decision-rights assignment and control, is usually handled by local managers. Some operating-level decisions are cross border. For example, transfer-pricing and cross-border sourcing decisions are the types of operating decisions made at a local level.

5.1.1. Management control system

A large portion of published international management accounting research investigates MCSs and culture. Several studies are designed to investigate differences in MCS at the operating level that are hypothesized to exist between companies in different countries because of Hofstede's (1967) culture differences (Chow, Shields, & Chan, 1991; Chow, Shields, et al., 1999; Harrison & McKinnon, 1999). For example, Chow, Shields, et al. (1999) use their study of the relation between culture and seven common MCS components to link together extant research examining culture's impact on individual MCS components. Section 4.1.3 provides a detailed discussion of culture's effect on MCS design and directions for future study of MCS.

However, only a few studies have begun to address how noncultural variables impact MCS designs. For example, Jiang and Kim (2000) and Nishimura (1995) both hint at the idea that observed differences in U.S. and Japanese MCSs might be a result of corporate governance and labor market differences, respectively. McMann and Nanni (1995) review the literature relating to Japanese management practices, including managerial accounting issues such as target costing. The majority of the articles included in their review are practice oriented and should prove useful in identifying important Japanese

³ Tables 1 and 2 contain research papers addressing management accounting issues from the set of journals identified earlier. Other citations are either review papers or examples and illustrations to support a point.

managerial accounting issues and how they could be studied empirically.⁴ From their review, McMann and Nanni conclude that Japanese managerial accounting techniques cannot simply be transferred to Western firms and locations without an improved understanding of how the Japanese employ particular accounting techniques at the operating level and the multiple goals behind their use. Future research could provide valuable insights into the design and use of firms' MCS by incorporating the interactive effects of environmental factors beyond culture that are discussed in this paper.

5.1.2. Performance evaluation and budgeting

Budgeting issues are inevitably intertwined with performance evaluation considerations. Since budgets serve both roles of decision-rights assignment and control of decision processes, the two are inextricably linked. However, extant research tends to focus on only one or the other of these roles and primarily uses culture to explain observed international differences. Schuler and Rogovsky (1998) show broad support for an association between culture and specific budget-based compensation packages. At the local level, it is not surprising that culture plays a significant role. Borkowski (1999) also provides some evidence that specific performance evaluation criteria of transnational corporations vary in importance by country. One exception to the focus on culture is Noerrekli and Schoenfeld (2000), who provide insights into the control problems faced by multinationals due to language, environmental, and communications barriers.

The effectiveness of international managers in budget preparation is a conventional topic for many published papers. For example, Tsui (2001) shows that the attitudes of Chinese and Western managers towards budget participation vary due to cultural differences. Similarly, Chow, Harrison, McKinnon, and Wu (1999) show that information sharing is affected by culture when comparing Taiwanese and Australian employees.

5.1.3. Product costing, transfer pricing, and taxes

Transfer pricing is a major issue in purely domestic firms. However, because of variation in taxes, foreign exchange considerations, and repatriation restrictions, international issues add significant complications to transfer pricing. For example, tax benefits of higher transfer prices (lower taxable income) must sometimes be offset against the higher import duties that are assigned to products with higher transfer prices (Emmanuel, 1999). Also, the use of transfer prices to circumvent dividend repatriation restrictions imposed by the government in which a subsidiary operates may be part of the equation (Collins et al., 1995, 1998). Collins et al. (1995) use IRS data to show that MNEs shift income between international tax jurisdictions to lower their tax liability. These income shifts affect product cost and potentially performance evaluation. Research involving international transfer pricing-related issues besides tax minimization could address the interaction among transfer pricing, performance evaluation, and product cost-related decisions (Heely & Nersesian, 1993).

Leitch and Barrett (1992) provide an extensive review of the analytical and empirical literature that examines the influence of various environmental factors on multinational transfer-pricing methods and objectives. For example, they note that firms practicing

⁴ See Table 4 in McMann and Nanni (1995) for studies involving international (i.e., more than one country) and Japanese managerial accounting issues.

Table 1
Published international managerial accounting research about operating and strategic-level decisions: decision-rights allocation and control^a

Panel A: Operating decisions						
Operating level						
	MCS	Performance evaluation system	Budgeting	Product costing systems	Transfer pricing and tax	
Affects decision-rights allocation	Ahrens (1997), Daniel and Reitsperger (1991), Harrison and McKinnon (1999), Noerrekrit and Schoenfeld (2000), Pratt et al. (1993)	Bailey, Chen, and Dou (1997), Borkowski (1999), Chan (1998), Nagy and Neal (2001), Schuler and Rogovsky (1998), Tsui (2001), Whitley (1999)	Chow, Harrison, et al. (1999), Harrison (1992), Kirsch and Johnson (1991), Tsui (2001)	Collins et al. (1998), Cravens and Shearon (1996), Harris (1993), Klassen, Lang, and Wolfson (1993)	Conover and Nichols (2000), Emmanuel (1999), Leitch and Barrett (1992), Tsui (1996)	
Affects decision control	Chow et al. (1991), Chow, Shields, et al. (1999), Daniel and Reitsperger (1991), Guilding, Cravens, and Tayles (2000), Harrison and McKinnon (1999), Nishimura (1995), Noerrekrit and Schoenfeld (2000), Wijerwardena and De Zoysa (1999)	Awashii, Chow, and Wu (1998), Chow, Hwang, Liao, and Wu (1998), Duangploy and Gray (1991), Harrison (1993), Kirsch and Johnson (1991), Lau and Tan (1998), Schuler and Rogovsky (1998), Whitley (1999)	Salter and Sharp (2001), Sharp and Salter (1997), Ueno and Sekaran (1992), Ueno and Wu (1993)	Brewer (1998), Cravens and Shearon (1996), Fleischman and Tyson (1998), Wijerwardena and De Zoysa (1999)	Collins et al. (1995), Leitch and Barrett (1992), Picciotto (1992)	

Panel B: Strategic decisions

Strategic level			
	Organizational structure	Market choice	Market-entry mode
Affects decision- rights allocation	Anderson and Lanen (1999), Chow, Kato, and Merchant (1996), Collins et al. (1995), Firth (1996), Groot and Merchant (2000), Hammond and Preston (1992), Jiang and Kim (2000), Krivogorsky (2000), Lin and Hui (1999), Luo et al. (2001), Williams and Seaman (2001)	Baydoun and Willett (1995), Kirsch et al. (2000)	Aulakh et al. (1998), Collins, Kemsley, et al. (1995), Groot and Merchant (2000), Kemsley (1998), Kirsch et al. (2000)
Affects decision control	Anderson and Lanen (1999), Borkowski (1999), Carr and Tomkins (1998), Chow, Kato, and Shields (1994), Firth (1996), Groot and Merchant (2000), Jiang and Kim (2000), Krivogorsky (2000), Merchant et al. (1995), Nagy and Neal (2001), Williams and Seaman (2001)	Kirsch et al. (2000)	Firth (1996), Groot and Merchant (2000), Luo et al. (2001)

^a See Table 2 in the appendix for elaboration on references made within table.

aggressive transfer-pricing policies are likely to encounter governmentally imposed restrictions designed to counter such MNE policies. Leitch and Barrett also call for research on transfer-pricing issues related to decision-rights allocation centralization versus decentralization for negotiated transfer-pricing methods. In addition, they address related decision control issues such as aligning lower level managers' incentives when they have transfer-pricing decision rights. Through a balanced use of survey, experimental, and archival research methods, researchers could gain a better understanding of these issues. For example, how do transfer-pricing and cost estimation policies influence choices concerning which market to enter and which mode(s) to employ when entering a market?

5.2. Strategic decisions

Fama and Jensen (1983a) identify the importance of the separation of decision control (ratification and monitoring) from decision management (initiation and implementation) in most complex organizations. Thus, strategic decisions involving ratification and monitoring are typically reserved for upper management. Organizational design choices define monitoring activities. These choices include identifying responsibility accounting systems, performance evaluation systems, and organization-wide MCSs. In addition, ratification of new product and market initiatives, market-entry choices, and which market to enter are typically reserved for upper management.

5.2.1. Organizational structure and design

The strategic decision about how to organize—along geographic or product line—has far-reaching consequences for decision-rights assignment and control. Anderson and Lanen (1999) adopt a field-based survey approach to study how changes in firm strategy and economic structures lead to changes in management accounting practices within 14 Indian firms. Such field-based surveys might provide an effective means for beginning to develop an understanding of how managerial accounting information is used to assign and control decision rights within different organizational structures.

Carr and Tomkins (1998) studied strategic investment decisions in four countries. They concluded that financial calculus offered by organizational systems was more heavily weighted in U.K. and U.S. companies than in German or Japanese. In German and Japanese companies, strategic links with suppliers and customers were frequently given more weight and profitability was seen to be the natural outcome of good management, but not the aim of good management. Finally, Carr and Tomkins show that U.S. companies complete more thorough competitive analyses. Carr and Tomkins suggest (but do not test) that the observed differences in strategic decision styles and procedures are related to differences in economic environments where Japan and German companies can take a longer term orientation because of the lack of short-term financial pressures.

5.2.2. Market choice

The choice of which markets to enter (market choice) also impacts international strategic decision-rights assignment and control. Choosing a market about which the firm already possesses extensive knowledge has significantly different implications than choosing a market dissimilar to a firm's existing markets and knowledge base. The higher

the similarity to existing markets, the more existing firm knowledge can be applied in that market. Global organizations are constantly assessing which markets to enter or which to abandon. In making those choices, companies weigh and evaluate important environmental factors, such as market risk, political risk, cultural priorities, foreign exchange risk, resource availability and cost, and access to markets. Additional considerations include social and legal stability (e.g., does the country's commercial law system have a history of resolving disputes in an acceptable manner?), existing accounting practices (e.g., are they acceptable, including tax incentives via transfer pricing?), a labor force with the requisite skill and desire to work, and a dependable infrastructure of communication, transportation, and medical services (Heely & Nersesian, 1993).

The role of management accountants and management accounting information in the market-choice process has had little empirical investigation. One exception is the study by Kirsch et al. (2000) who examined the penetration of the Big Six international accounting firms in China. Kirsch et al. created a model showing that growth potential, client needs, a favorable political/legal climate, and cultural considerations were important factors in determining market choice. Although not specifically investigated by Kirsch et al., the role of the controller could include providing information about financing risks, foreign exchange risks, resource costs, operating costs, changes in control systems necessary for cultural and educational compatibility, appropriate systems for motivating employees, etc.

An additional consideration for the market-choice decision is caused by a lack of individuals with management accounting knowledge. This lack of knowledge could be a crucial barrier to entry. Baydoun and Willett (1995) indicate that accounting systems of developing countries are frequently incompatible with Western accounting systems. They document the introduction of the French Unified Accounting System into Lebanon and investigate its cultural relevance. In another example, Brinkman (1993) details problems that arose when a McCormick subsidiary, Gilroy Foods, entered into JVs in Egypt and Mexico. Gilroy found a lack of knowledge about accounting techniques and computer technology, language and cultural barriers, unreliable communication channels, a hyper-inflationary economy calling for inflation-adjusted accounting numbers, and distance and time barriers.

These problems in entering unfamiliar markets create costly decision-rights partitioning and control problems. An interesting researchable topic is the increased costs imposed by a lack of accounting knowledge, language and cultural barriers, time and distance, or inflationary economies, etc., for establishing accounting procedures and processes in international firms. It is not clear if or how organizational decision makers are aware of and account for these costs when making market choices. Field-based surveys (e.g., see Anderson & Lanen, 1999) might prove useful in examining exactly how and what managerial accounting information is used in deciding which markets to enter (e.g., international competitor cost estimation).

5.2.3. Market entry mode choice

Simultaneously with market-choice decisions, organizations choose market-entry modes. Although market-entry mode can take on a variety of formats, the focus here is on the most commonly observed: export, licensing, greenfield sites, acquisition, or JV.

Since entry choices involve legal contracts, they can have considerable impact on resulting decision-rights assignment and control mechanisms. Thus, the operating costs to the organization differ substantially depending on the chosen market-entry vehicle. However, little research exists that empirically explores the determinants of entry-mode choice (for an example, see Kim & Hwang, 1992) or more specifically the role of management accounting in those decisions. One related exception is Kemsley (1998), which finds that a binding foreign tax credit is an incentive that significantly increases MNEs' relative proportion of exports to foreign production. The results suggest that the marginal costs of changing production location often are lower than the marginal costs of adopting alternative tax-planning strategies, such as income shifting.

Differing market-entry modes require differing degrees of decision-rights allocation. For instance, foreign production results in a greater allocation of decision rights than simply exporting. Export-only approaches to entering foreign markets protect firm-specific knowledge, which can be endangered in JV or licensing agreements. Export only also involves low resource commitment in the foreign market and low costs for reassigning decision-rights and control system development. However, export-only strategies involve heavy transportation costs and frequently are limited by political considerations. Licensing agreements can typically overcome the transportation and political problems, but the organization loses control of firm-specialized knowledge and distribution control (Aulakh et al., 1998).

The organization may decide, for strategic or political reasons, that a larger resource commitment in the foreign country is necessary (Kirsch et al., 2000). Organizations typically choose either a wholly owned subsidiary or a JV arrangement. A JV or a wholly owned subsidiary can be acquired or built from scratch (greenfield site). Acquiring an existing business poses special decision assignment and control problems (Blodgett, 1992). Existing organizations have established rights assignment and control systems. Integrating an acquired subsidiary's (or JV's) rights assignment and control system into the parent's may impose major costs. The degree of parent-imposed reporting requirements depends on the amount of control the parent wants to maintain, the resource commitment of the parent, and strategic and political considerations. Neither the extent nor the cost of reassignment of decision rights and control in acquired subsidiaries or into account JVs has been examined empirically.

Previous research shows that cross-border operations have roughly a 50% success rate (Geringer & Hebert, 1991). Further, that success rate is independent of whether the operation is an acquisition or an alliance, such as a JV. However, JVs between strong and weak companies rarely work and lead to mediocre performance (Bleeke & Ernst, 1991; Luo, Shenkar, & Nyaw, 2001). Luo et al. (2001) compared the control–performance relationship for foreign versus local parents in international JVs in China. Their results show a relationship between the foreign parent financial stake, control and performance. Other studies suggest that what matters is clear management control, not financial ownership. Groot and Merchant (2000) completed detailed case studies of three successful international JVs. They found significant differences between the control features in the three JVs and they call for more research to examine the contingent nature of controls in JV operations. It seems clear from Bleeke and Ernst's (1991) and Groot and Merchant's research that management accounting systems play a significant role in the international JV agreement

and in the potential for success of the JV. The role of management accounting in JV control calls for further research.

When considering whether an acquisition or alliance is a more appropriate choice in cross-border operations, the business venture's relation to the existing businesses of the firm is the key. Acquisitions work well when expanding the existing core business, and alliances are more successful when expanding into unfamiliar geographic regions or entering new business areas. The ability to collocate specialized geographic or business knowledge with operations in distant geographic locations can provide competitive advantages to firms. Knowledge of local markets, suppliers, sources of capital, and culture are important for the successful operation of international subsidiaries. However, the MCS must be designed to motivate individuals in the alliance to use that specialized knowledge in the best interests of the parent. Research is needed to investigate when the management accounting system motivates the acquisition, transfer, and proper use of the idiosyncratic knowledge needed to operate successfully internationally.

Because firms use their accounting system as a means of communicating when cultural and language barriers are present, internal auditors or management accountants are frequently among the first individuals from the parent to be assigned to work at the site of newly acquired subsidiaries. Communicating the subsidiaries' status through the language of accounting becomes critical. The operations budgeting, performance evaluation, cost accumulation, capital budgeting, incentive, and asset-measurement systems provide the cross-border language that conveys the status of the firm's investments around the world. Further study of the importance of internal accounting reports in the integration of international operations would provide a basis for understanding decision-rights assignment and control issues as they develop.

International subsidiary operations can be classified as net exporters, net importers, or mostly domestic operations. Domestic subsidiaries have the fewest cross-border transactions and less exchange-fluctuation exposure. Net importers and exporters face transaction risk from exchange fluctuation. The impact of foreign-exchange exposure on decision-rights assignment and control has not been well documented. Some decision rights (e.g., hedging, borrowing, and capital budgeting) are impacted by foreign exchange exposure (Carr & Tomkins, 1998). Little research has been done to correlate, for example, the decision-rights assignment and control represented in the budgeting process with foreign exchange exposure (for examples, see Borkowski, 1999; Kirsch & Johnson, 1991). Does exposure risk regulate decision-rights assignment? Is performance evaluation significantly influenced by foreign exchange fluctuation and if so how?

Answers to these interrelated questions may explain observed variation in cost accumulation and asset measurement systems. For example, would cost accumulation processes vary depending on the significance of foreign exchange fluctuation impacts on product input costs? Would asset measurement in highly inflationary environments require supplementary information to the traditional historical costing approach? Changes in these basic measurement systems impact decision-rights assignment and control in ways not understood or well documented.

Table 1, panel A, displays our observation that the majority of international managerial accounting research relates to operating decisions. We suggested continued research in this area is needed. However, research involving how MNEs use managerial accounting

information and practices for strategic decisions (Table 1, panel B) is even less explored and only now beginning to attract researchers. Finally, future research should consider how environmental factors influence MNEs' use of managerial accounting in both operating and strategic decisions.

6. Summary and conclusion

This paper uses contracting theory as a guide for thinking about the role of management accounting in the international firm. Contracting theory predicts multiple uses of accounting procedures in assigning and partitioning decision rights and in implementing decision control. These rights assignment and control choices interact with the operating and strategic-level economic decisions made within the firm. Also, the interdependent relationship between these decisions and environmental factors is discussed. We use the contracting framework to organize and classify international managerial accounting research from the past 10 years. Undoubtedly, our classifications and literature reviews may have overlooked papers that should be included in this review. We hope that the review and framework of the multiple uses of managerial accounting in MNEs will identify opportunities for and spark research in international managerial accounting.

In particular, the lack of research about international market choice and entry-mode decisions (see Table 1) suggests a need for research about the costs of entering and operating in different global market settings. These costs include the cost of additional or different controls necessary in some international settings as a result of cultural, economic, educational, or political risks. Choice of market-entry vehicles is impacted by the firm's desire to use geographically diverse knowledge and guard firm-specific knowledge that may provide competitive advantage. Market-entry mode has significant influence on the design and use of management accounting information in decision-rights assignment and control. Very little research has documented or identified the changes to the firm's decision-rights assignment pattern (e.g., budgeting processes) or the decision controls (e.g., performance monitoring and evaluation) resulting from these international strategic decisions.

On-going international operating decisions pose additional demands on the firm's management accounting system. For example, when using internal accounting information to compare performance across international locations, foreign currency exchange issues become important. In addition, partitioning of decision rights through, for example, budgeting will be dependent on sources of local specific knowledge that can provide competitive advantage. Environmental factors, such as economic, political, educational, and cultural differences, presumably influence the effectiveness of accounting information in the firm's decision-rights and control mechanisms. Yet these interdependencies are not well understood. Interdependencies in international operations offer rich environments for studying the impact of management accounting in firm operations.

As with any research, limitations to the current study need to be identified. In particular, the use of contracting theory affects how we categorize existing research and identify future research opportunities. In particular, some researchers criticize contracting theory for insufficiently incorporating behavioral effects, such as altruism and human information

processing limitations, into analyses and outcome predictions (Fama & Jensen, 1983b). Therefore, our adoption of a contracting perspective for developing the framework might fail to recognize certain behavioral-related uses of accounting in MNEs. Other theoretical frameworks might better identify such uses. Also, to the extent that our sampling procedure and therefore our research sample is biased by the 10-year time frame, the selected set of journals, or by our definition of international managerial accounting, our analysis of existing published international managerial accounting research and identification of future research opportunities is similarly biased.

International managerial accounting is in its research infancy and presents opportunities for understanding the international decision partitioning and decision-control features of internal accounting systems. The cultural, economic, educational, and political richness of the global economy provides settings to examine differences in accounting procedures and to relate such differences to differences in underlying global decisions. This type of research could help explain the organizational costs and benefits associated with operating in international markets.

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Table 2

Summary hypotheses, and results of studies, referenced in the framework of Table 1

Author (date)	Summary	Hypotheses	Results
Mucens (1997)	The functioning of accounting in organizations depends on its combination with other forms of organizational knowledge and communication. This paper analyzes some of the communication observed in paired situations in French and German brewers, in order to confront the intertwining of accounting and other expertise and relate it to the use of various organizational orders.	N/A	The focus on accounting communication emerges as an approach to the study of the organizational practice of accounting, which helps yield insight into the complex processes of enacting the orders (i.e., flexibility and fragility) that accounting engenders.
Anderson and Lamen (1999)	Liberalization of the Indian economy in 1991 increased the intensity of international competition and changed the internal information needs of Indian managers. This study examines the evolution of a broad range of management accounting practices in 11 firms using a contingency theory framework.	The general hypothesis is that changes in firms' management accounting practices are impacted by changes in the exogenous environment (e.g., enactment of major economic reforms) and differences in firms' endogenous capabilities (e.g., international orientation and competitive strategies). H1 : Licensor involvement in a foreign market will be higher under a royalties-based compensation structure than under a lump sum fee compensation structure. H2 : The level of intellectual property protection in the host market is positively related to the use of royalties-based compensation structure. H3 : The favorableness of the host country economic environment is positively related to the use of royalties-based compensation structure.	Overall, the results support the hypotheses. The evidence suggests that changes in the external environment lead to changes in management accounting practices involving organizational strategy and structure.
Aufakb et al. (1998)	Using a survey of U.S. firms, this study examines licensing agreements between independent firms based on their compensation structures. A licensor's ability to monitor and influence foreign licensees is related to the type of compensation used in structuring the relationship. Next, a set of factors is identified, such as conditions of the host country where the technology is licensed, stage in the technology life cycle, and licensor firm characteristics that impact the choice between different compensation structures.	H1 : Supported H2 : Supported H3 : Supported H4 : Supported H5 : Not supported H6 : Not supported This study shows that environmental factors have significant impacts on the structure of international licensing contracts.	

Anshah et al. (1998)	<p>The effects of individualistic and collectivist cultures on individuals' decisions in a team based work setting</p> <p>Use a Laboratory experiment with U.S. and Chinese nationals residing in Taiwan</p>	<p>H4: Lump sum fee compensation structure is more likely to be used in the introduction and decline stages of the technology life cycle and royalties-based compensation structure in the growth stage of the technology life cycle</p> <p>H5: The international experience of the licensor firm is positively related to the use of a royalties-based compensation structure</p> <p>H6: The size of the licensor firm is positively related to the use of a royalties-based compensation structure</p> <p>H1: Both U.S. and Chinese nationals will have a greater preference for team based over individual based performance measures as perceived task interdependence increases</p> <p>H2: U.S. relative to Chinese nationals will have a greater preference for individual based over team based performance measures, holding task interdependence constant</p> <p>H3: U.S. relative to Chinese nationals will make decisions favoring their own performance over that of their teams, holding constant both the performance measure and the task interdependence</p> <p>H11: Respondents from the U.S. will have a higher desire for performance feedback that emphasizes success than will respondents from either Japan or China</p> <p>H2: Respondents from Japan and China will have a higher desire for performance feedback that emphasizes failure than will respondents from the U.S.</p>	<p>No support for any of the hypotheses. Only the U.S. subjects chose more team based performance measures as task interdependence increased. In addition, the U.S. subjects made greater self-sacrifices in favor of the team contrary to what was expected. U.S. subjects made more research expenditures that promoted team oriented behavior</p>
Bales et al. (1997)	<p>Effective international management requires knowledge of culturally patterned self-concept, and consultant feedback desires. This paper argues that the cultural forces of individualism versus collectivism shape self-concept and by extension also shape individual performance evaluation and feedback seeking</p>	<p>H1: Partially supported</p> <p>H1': Fully supported</p> <p>H3: Partially supported</p> <p>H4: Partially supported</p> <p>H5: Supported</p> <p>H6: Supported</p>	

(continued on next page)

Table 2 (continued)

Author (date)	Summary	Hypotheses	Results
Baydoun and Willett (1995)	The accounting systems used in developing countries might not be relevant with respect to the needs of developing countries because the systems originated in Western countries with different cultural values. Prior research is vague in its assessment of exactly which aspects of Western accounting systems fail to meet the test of relevance.	<p>H3: Respondents from the U.S. will take more initiative to seek individual performance feedback than will respondents from either Japan or China.</p> <p>H4: Respondents from the U.S. will report that their job environment provides more individual performance feedback than will respondents from Japan and China.</p> <p>H5: Regardless of national origin, respondents who have a high desire for self-appraisal will take more initiative to seek individual performance feedback than will respondents who have a low desire for self-appraisal.</p> <p>H6: Regardless of national origin, respondents who have a high desire for self-appraisal will perceive that their job environment provides more individual performance feedback than will respondents who have a low desire for self-appraisal.</p> <p>N/A</p>	<p>The effect of the importation of the French Unified Accounting System to Lebanon is examined and an amended version of the Hofstede-Gray cultural-accounting frame work is used to clarify the concept of cultural relevance.</p> <p>H1: Supported H2: Weakly supported H3: Not supported H4: Not supported</p>
Borkowski (1999)	This study fails to support the generally accepted theory that transnational corporations (TNC's) use different criteria to evaluate managers based on their location (host or home country). If it is assumed that a major TNC strategy is to maximize profits, thus maximizing returns to shareholders, it follows that management	<p>H1: TNC's do not use different criteria for domestic and foreign managerial-performance evaluation.</p> <p>H2: Performance-evaluation criteria used by U.S.-based TNCs do not differ from criteria used by non U.S.-based TNCs.</p>	
Borkowski (1999)			

- H3:** Short-term (optimistic) and long-term (pessimistic) country orientations do not influence performance-evaluation criteria.
- H4:** Performance-evaluation criteria are not affected by a TNC's transfer-pricing method.
- Six predictions about how culture could affect an ABC implementation are constructed, but only two are examined in an ABC implementation.
- The strategic orientation of a company is hypothesized to be affected by the short- or long-term orientation of the cultural and economic system in which they operate.
- H1:** Negotiators will set higher target profits in a high-accountability condition than in a low accountability condition.
- H2:** Negotiators will set lower target profits in a firm-based performance evaluation scheme than in a division-based scheme.
- H3:** Negotiators in a firm-based evaluation scheme will achieve: a) higher joint profit and b) have less difference between final offers.
- H4:** Firm-based performance evaluation and high accountability will result in highest joint profits.
- H5:** Firm-based performance evaluation and high accountability will result in the least difference between final offers.
- Findings indicate that the top-down implementation approach coupled with ABC's emphasis on cross-functional team work contributed to a higher level of ABC success at the Malaysians relative to the U.S. plant.
- Anglo-American short-termism reflects an emphasis on financial control. Strategic decision processes in Germany and Japan seem to be more oriented toward customers and suppliers.
- All hypotheses supported except H3 b). Further investigation reveals accountability and culture interactions. Under high accountability, Australians achieved a higher joint profit than their American counterparts. Americans believed high accountability was a signal to achieve better individual outcomes.
- decisions are made with this strategy as the desired outcome. Current theory does not address the more global view of the TNC where subsidiaries act in concert to maximize profits, and, therefore, can be evaluated in a similar fashion. There is some evidence, however, that specific performance-evaluation criteria do vary in importance by country.
- Hofstede's taxonomy is used to examine relationships between national culture and implementation of activity-based costing. The implementation of ABC by Harris Semiconductor in plants located in Malaysia and the U.S.
- Strategic decision making is contrasted among companies from Britain, Germany, the U.S.A. and Japan using a sample of 78 decision by 71 manufacturers.
- Empirically examines the effects of accountability and performance-evaluation scheme on transfer-pricing negotiation behavior and outcomes. Using a two-party face-to-face negotiation task, 240 American and 160 Australian subjects' negotiations were evaluated for joint profits and differences between final offers.

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Table 2 (continued)

Author (date)	Summary	Hypotheses	Results
Chow, Harrison, et al. (1999)	This study examines cultural factors that may facilitate or impede the sharing of informal information in the context of face-to-face meetings involving both Chinese and Anglo-American organizations. Both qualitative and quantitative data were collected through personal interviews with middle level managers in a sample of Taiwanese and Australian manufacturing firms.	H1: There is no interaction between the presence or absence of a superior and a subordinate's culture (Anglo-American or Chinese) affecting the subordinate's propensity to share information through (a) asking a clarifying question, (b) expressing a contrary or challenging opinion, and (c) the open forum of a face-to-face meeting.	The results highlight the importance of individual differences, individual assertiveness, and corporate culture in influencing informal information sharing in Australia. The results also demonstrate the trade-off among collective interests, respect for hierarchical status, and concern with face in Taiwan.
Chow et al. (1998)	This paper experimentally examines how two behavioral factors, social pressure and national culture, interact with a linear profit-sharing scheme (LPS) to affect subordinates' misrepresentations of private information. Taiwanese nationals (undergraduate students) and U.S. nationals (undergraduate students) were faced with the same incentive scheme and with superior communication.	H1: In the absence of face-to-face interactions with superiors, Chinese nationals misrepresent their private information to a lesser extent than U.S. nationals working under the same pay schemes. H2: Controlling for the type of scheme, face-to-face interactions with superiors reduce misrepresentations by Chinese nationals more than they do for U.S. nationals. H1: Overall, the controls imposed on U.S. profit center managers are tighter than those imposed on their Japanese counterparts. H2: Compared to their U.S. counterparts, Japanese profit center managers are subject to tighter procedural controls. H3: Compared to their U.S. counterparts, Japanese profit center managers are subject to tighter controls through directives given by superiors at meetings. H4: Controlling for the degree of control system tightness, the extent of dysfunctional behavior is lower among Japanese than U.S. profit center managers.	H1: Supported H2: Not supported Taiwanese students misrepresented their private information to a lesser degree than U.S. students. Additionally, face-to-face (FF) communication with superiors combined with an LPS incentive scheme significantly reduced the extent of misrepresentation of private information relative to an LPS scheme alone. H1: Not supported H2: Supported H3: Supported H4: Supported Results show when faced with the same level of control tightness, Japanese managers did not engage in as high a level of dysfunctional activities. However, contrary to prediction, Japanese managers were subject to significantly tighter controls overall than were U.S. managers.
Chow et al. (1996)	Prior papers explored the use and effects of five management controls at the profit-center level of large U.S. firms. This paper extends previous investigations to a cross-cultural context. Predictions are that relative to their U.S. counterparts, Japanese profit-center managers would be subject to tighter procedural controls and controls via directives given at meetings.		
Chow et al. (1996)			

<p>Chow et al. (1994)</p>	<p>This paper uses Hofstede's (1967) taxonomy of work-related national cultural dimensions to analyze preferences for specific management controls at the interface between the organization and the external labor market. Japanese and U.S. MBA students served as experimental subjects.</p>	<p>H1: Japanese and American preference for controllability filters is an ordinal interaction of environmental uncertainty and national culture. H2: Japanese and American preference for top-down planning is an ordinal interaction of centralization and national culture. H3: Japanese and American preference for team-based rewards is an ordinal interaction of horizontal interdependency and national culture. H4: Japanese and American preference for a set of control components is a function of national culture.</p>	<p>H1: Japanese and American preference for a set of control components is a function of national culture. H2: Japanese and American preference for a set of control components is a function of national culture. H3: Japanese and American preference for a set of control components is a function of national culture. H4: Japanese and American preference for a set of control components is a function of national culture.</p>	<p>H1: Not supported H2: Not supported H3: Not supported H4: Supported</p>	<p>Most of the hypotheses are not supported, which is used as the basis for suggesting potential directions for future empirical refinements and theory construction.</p>
<p>Chow et al. (1991)</p>	<p>The study examined whether Asian firms' superior manufacturing performance can be attributed to (1) the "individualism" cultural dimension of employees, (2) the use of specific manufacturing strategies and control systems (e.g., workflow and pay interdependencies) by management, or (3) an interaction of national culture and manufacturing and control systems. The authors employed an experimental approach using 192 senior (undergraduate) accounting majors. Half of the sample consisted of U.S. nationals enrolled in a large U.S. university, while the other half was comprised of Singapore nationals enrolled in a university in Singapore.</p>	<p>H1: A worker's cultural individualism, the extent of interworker workflow interdependence, and the extent of interworker pay interdependence have both independent and interactive effects on performance H2: Workers with a low individualistic cultural orientation perform higher when workflow and/or pay are dependent and lower when workflow and/or pay are independent. H3: Workers with a high individualistic cultural orientation perform higher when workflow and/or pay are independent and lower when workflow and/or pay are dependent. H4: When there is workflow and/or pay dependence, workers with a low individualistic cultural orientation outperform workers with a high individualistic cultural orientation.</p>	<p>H1: Not supported H2: Not supported H3: Weakly supported H4: Weakly supported H5: Not supported</p>	<p>H1: Not supported H2: Not supported H3: Weakly supported H4: Weakly supported H5: Not supported</p>	<p></p>

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Table 2 (continued)

Author (date)	Summary	Hypotheses	Results
Chow, Shields, et al. (1999)	The paper attempts to assess the importance of national culture in determining if and how firms modify their MCSs in cross-border contexts. Using Hofstede's (1980) four-dimensional operationalization of national culture, the authors predict directional differences between Japanese-, Taiwanese-, and U.S.-owned firms' preference for and design of seven internally focused MCS components. Eighteen firms operating in Taiwan are surveyed to collect information about the "fit" of their management controls.	<p>H5: When there is workflow and/or pay independence, workers with a high individualistic cultural orientation outperform workers with a low individualistic cultural orientation.</p> <p>H1: The controls used by firms operating in the same foreign country would not differ from each other or those of the locally owned firms.</p> <p>H2: The similarity between local employees' preferred MCS and the design of the MCS would not differ between foreign and locally owned firms.</p>	<p>H1: Supported for most of the management controls tested.</p> <p>H2: Supported</p> <p>Overall, the paper finds some evidence that implementing various socialization activities can lead to the same level of fit when different MCSs are employed within the same culture.</p>
Collins et al. (1998)	Examines the extent to which U.S. MNEs shift income between the U.S. and foreign jurisdictions. The study also investigates whether investors appear to value shifted income with its true rather than its reported source. Support would suggest that investors recognize tax-motivated earnings management on the part of income shifting MNE managers. Employs regression analysis for a sample of 577 manufacturing companies from 1984 to 1992 obtained from Compustat.	<p>There are two general hypotheses. The first is that U.S. MNEs respond to relatively high foreign tax rates by shifting income to the United States. The second is that if unshifted domestic and foreign income are priced differently and if investors recognize that a portion of foreign income is reported as domestic income, then investors will reflect shifted foreign income in the multiple they apply to the domestic earnings of income shifters.</p>	<p>Find support for both hypotheses in that the predicted MNEs appear to shift income from high-tax foreign jurisdictions into the United States, and the markets appear to capitalize shifted foreign income consistent with its true rather than its reported source. Such a finding implies that tax-motivated income shifting might not necessarily result in large security price distortions.</p>

- Collins et al. (1995) Examine whether the previously documented phenomenon of approximately zero taxable income by foreign-controlled domestic corporations (FCDCs) is a result of income shifting via transfer pricing or instead suggestive of some other issue at work. Employs regression analysis to study FCDC in the wholesale trade industry from 1981 to 1990 using U.S. corporate income tax return data from the Statistics of Income division of the Internal Revenue Service. A control sample for the same period was also drawn from Compustat.
- Conover and Nichols (2000) This study evaluates the effect of firm size on income shifting between international tax jurisdictions through the use of transfer prices both before and after the passage of the Tax Reform Act of 1986 (TRA86).
- Cravens and Shearon (1996) The study employs a mail survey with a sample of 82 publicly traded U.S.-based multinational firms to determine whether the international transfer-pricing method affects the financial outcomes of transfer pricing objectives. Most extant research on transfer pricing has examined the determinants of transfer-pricing methods. Cravens and Shearon go another step and use transfer-pricing methods, as well as several other explanatory variables, to try and explain the success of accomplishing transfer-pricing financial objectives, such as managing the firm's tax burden. The data are analyzed using two multiple regression models.
- The results provide evidence of a relationship between sales and gross margin that is consistent with transfer-pricing income shifting. The study also finds the existence of such a relationship using data that are free of any cross-jurisdictional income shifting.
- The findings suggest that smaller (or distressed) firms are less likely to shift income via transfer-pricing than are larger firms.
- Results suggest that MNC's use international transfer pricing to obtain a variety of financial objectives. For example, foreign sales percentage was significant in the model explaining the maintenance of competitive market position, but not in the tax burden management model. Such a result suggests that foreign sales might be a more important factor relating to competitive position than to management of tax burden.

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Table 2 (continued)

Author (date)	Summary	Hypotheses	Results
Daniel and Reitsperger (1991)	The paper examined whether firms tailor their MCSs to complement their quality strategies. The authors adopted a questionnaire approach, receiving 459 surveys from 26 Japanese consumer electronics and automotive manufacturers appearing in the first and second sections of the Tokyo, Osaka, and Nagoya stock exchanges.	<p>H1: The MCS supporting a zero-defect quality strategy is more likely to include the provision of quality goals to production personnel than the MCS for an ECL strategy.</p> <p>H2: The MCS supporting a zero-defect strategy will provide more frequent quality feedback than the system supporting an ECL strategy.</p> <p>H3: The MCS supporting zero-defect strategy is more likely to include combined goal setting and feedback for quality than the system supporting an ECL strategy.</p> <p>H4: The MCS supporting a zero-defect strategy is more likely to focus on unit rather than cost information for quality.</p> <p>The general hypothesis is that in the late 1980s U.S. managers persist in their use of financial data that have been translated into U.S. dollars versus data remaining in the local (foreign) currency when evaluating and controlling foreign operations.</p>	<p>H1: Weakly supported H2: Weakly supported H3: Supported H4: Not supported</p> <p>Results were somewhat weak. Interestingly, the surveyed Japanese managers did not appear as strongly committed to zero-defect quality strategies as some studies have suggested.</p>
Duangploy and Gray (1991)	Uses a mail survey approach to receive usable responses from 111 Fortune 500 MNEs. The study examines whether U.S.-based MNE managers employed different techniques for performance evaluation and control of foreign operations during the late 1980s than were used in the late 1970s and early 1980s. Twelve of the 11 MNEs were randomly selected for participation in telephone interviews to investigate specific follow-up issues, such as why certain evaluation and currency translation methods were applied within the firm.	<p>The general hypothesis is that in the late 1980s U.S. managers persist in their use of financial data that have been translated into U.S. dollars versus data remaining in the local (foreign) currency when evaluating and controlling foreign operations.</p>	<p>Found evidence that compared to U.K. MNE managers, U.S. MNE managers are more parent company oriented, as demonstrated by U.S. managers' more prevalent use of after-translation financial measures when evaluating performance of foreign operations. Also found that profit is the primary performance measure used, an increased emphasis on comparing "budget to actual" profit and a decreased emphasis on ROI.</p>

Within the limitations of the example, it seems that the existence of dissimilar forms of tax in different jurisdictions, rather than differential rates within a specific tax, influences substantially the capability to maximize global after-tax income.

N/A

International transfer pricing (ITP) is used by MNEs to minimize global tax liability. This is a rational economic response to market imperfections created by national governments. An alternative view decries such actions as anticompetitive and an abuse of power. This paper examines the potential benefit to MNEs of ITP manipulation when a real-world combination of fiscal rules is simultaneously applied in practices.

Emmanuel
(1999)

Until recently, management accounting information and detailed cost and profitability data were of limited use to the management of enterprises in the People's Republic of China (PRC) as they had few discretionary decision-making responsibilities. The recent move away from central economic planning and the introduction of competitive markets and private ownership of firms has led Chinese enterprises to question whether their existing accounting systems are adequate and to search for alternatives. The paper hypothesizes that the accounting systems employed by the JV operation, which invariably are designed by the foreign partner, will have a significant influence on the development of, and content of, management accounting in the Chinese partner.

Firth (1996)

H1: The diffusion of accounting innovation is associated with the nationality of the foreign partner (change agent).

H2: U.S.-partnered JVs are associated with higher levels of diffusion of accounting ideas, with Europe, "other," Japan, and Hong Kong following in that order.

H3: There is a positive association between the adoption of the JV's accounting techniques by the Chinese partner and the extent to which the Chinese partner faces competitive markets. This association will be especially strong for those accounting techniques that contribute toward profitability analyses.

H4: The assignment of the Chinese partner accounting personnel to the JV is positively related to the transfer of accounting technology from the JV to the Sino partner.

H5: The eventual return of seconded personnel to the Sino partner is positively related to the transfer of accounting technology from the JV to the Sino partner.

H1: Supported
H2: Supported
H3: Supported
H4: Not supported
H5: Not supported
H6: Not supported
H7: Not supported

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Table 2 (continued)

Author (date)	Summary	Hypotheses	Results
Fleischman and Tyson (1998)	This paper traces the evolution of standard costing in the United Kingdom and United States and describes how it has served its purpose in these two countries over time. Also, the nature of standard costing practices existing during the British Industrial Revolution is compared with standard costing practices that evolved in the United States under scientific management.	<p>H6: The physical nearness of the Chinese partner and the JV operations is positively related to the transfer of accounting technology from the JV to the Sino partner.</p> <p>H7: The relationship between the training of Chinese personnel in the JV's accounting procedures and the extent of accounting knowledge transferred from the JV to the Sino partner is positive.</p> <p>N/A</p>	<p>The paper argues that the environment and reasoning for using standard costs have changed over time and that in the future they will be used less frequently for individual control and more for decision making.</p>
Groot and Merchant (2000)	This paper reports the results of a largely exploratory study of the control practices employed by partners involved in three international joint ventures (IJVs). The study finds several control-system similarities among the three IJVs, as well as several significant differences related to the use of dispute-settling mechanisms, control focus (broad vs. narrow), and control tightness. The paper describes some of the factors that seem to cause the differences and thus provides a starting point for a contingency theory of IJV control.	<p>H1: Partners' objectives for an IJV will be directly reflected in their IJV control system and that, in particular, (a) when partners' objectives are phrased in terms of financial returns, they will place relatively high reliance on financially oriented results controls; (b) when partners have a broad set of objectives for an IJV, their control focus will be broad.</p> <p>H2: When partners use an IJV to diversify their product offerings (rather than to extend the geographical coverage of their existing product lines), they will tend to use relatively loose controls.</p>	<p>H1: (a) Not supported; (b) supported</p> <p>H2: Weakly supported</p> <p>H3: Not supported</p> <p>H4: (a) Weakly supported; (b) weakly supported</p>

<p>H3: When trust between (or among) IJV partners is relatively low, (a) the partners' controls over the IJV will be relatively tight; (b) the partners' control focus will be relatively broad.</p> <p>H4: When recent IJV performance is relatively high, partners will use (a) looser controls over the IJV; (b) a narrower control focus.</p>						
<p>Guilding et al. (2000)</p> <p>Hammond and Preston (1992)</p>	<p>A survey of large companies in New Zealand, the United Kingdom, and United States was conducted to assess perceived importance and usage of 12 strategic management accounting practices.</p> <p>Several diverse strands of accounting research have recently exhibited fascination with issues of power, gender, race, and Japanese culture. <i>Crafting Selves: Power, Gender, and Discourses of Identity in a Japanese Workplace</i>, by Kondo (1990), explores each of these topics and thus provides a rare opportunity to reflect upon the direction of accounting research in these areas. Although Kondo does not specifically refer to accounting, Hammond and Preston utilize Kondo's exploration of the "company as family" idiom and Kondo's experience working in a small Japanese factory to challenge the ethnocentric views of Japanese culture and business practice prevalent in many management and accounting texts.</p>	<p>N/A</p>				<p>(continued on next page)</p>

Cross-country comparisons show similar levels of SMA usage. Controlling for company size show that some practices are used more in New Zealand.

Kondo's analysis of power differentials and modes of exclusion according to class, race, and gender have significant implications for accounting research, which typically does not recognize the complexity and importance of these issues.

Table 2 (continued)

Author (date)	Summary	Hypotheses	Results
Harris (1993)	This paper compares U.S. MNC's' domestic and worldwide income and capital location behavior before and after the Tax Reform Act of 1986 in an attempt to determine whether such firms engaged in income and capital location shifting as a result of TRA86. The paper is one of the first on this issue to adopt a longitudinal approach and samples MNC's and domestic firms from 7593 to 4321 firms listed on Compustat PC Plus and PC Plus Global Vantage, respectively, from 1984 to 1990.	<p>H1: After the TRA86 passage, MC's shifted relatively more net income into the United States, and firms with the lowest cost of doing so reacted most strongly.</p> <p>H2: After the TRA86 passage, MC's located more capital outside of the United States relative to their U.S. investment, and firms experiencing the greatest increases in U.S. costs of capital reacted most strongly.</p> <p>H3: An increase in foreign investment will be associated with a decrease in U.S. investment, and firms experiencing the greatest predicted increase in the cost of capital reacted most strongly.</p>	<p>H1: Supported</p> <p>H2: Supported</p> <p>H3: Not supported</p>
Harrison (1992)	This paper uses Hofstede's (1967) cultural dimensions of power distance and individualism to examine the cross-cultural or cross-national generalizability of participation's effect on the relation between budget emphasis in superior evaluative style and subordinates' job related attitudes.	<p>H1: The influence of participation on the relationship between budget emphasis in superior evaluative style and subordinate job-related tension is independent of culture.</p> <p>H2: The influence of participation on the relationship between budget emphasis in superior evaluative style and subordinate job satisfaction is independent of culture.</p>	<p>H1: Supported</p> <p>H2: Supported</p>

Harrison (1993)	Examines the cross-cultural relationship among culture, personality, and reliance on accounting performance measures (RAPM) on job-related tension and job satisfaction. The author employs a regression analysis of questionnaire data obtained from middle-level managers in department and retail stores in Singapore and Australia. In general, cultural-based hypotheses are supported but personality-based hypotheses are not supported.	<p>H1.1 (and H1.2): There is no interaction between RAPM and a subordinate's culture affecting job-related tension (job satisfaction).</p> <p>H2.1 (and H2.2): There is no interaction between RAPM and a subordinate's level of authoritarianism affecting job-related tension (job satisfaction).</p> <p>H3.1 (and H3.2): There is no interaction between RAPM and a subordinate's level of individualism collectivism affecting job-related tension (job satisfaction).</p> <p>H4.1 (and H4.2): There is no interaction among RAPM, a subordinate's culture, and a subordinate's level of authoritarianism affecting job-related tension (job satisfaction).</p> <p>H4.3 (and H4.4): There is no interaction among RAPM, a subordinate's culture, and a subordinate's level of individualism collectivism affecting job-related tension (job satisfaction).</p>	<p>Rejected H1.1, H1.2, and H4.1. Failed to reject H2.1, H2.2, and H4.2. H3.1, H3.2, H4.3, and H4.4 were not tested due to inadequate reliability measures for the personality variable of individualism collectivism.</p>
Harrison and McKinnon, 1999	Reports the results of a survey and review of 15 years of English language journal articles focusing on MCS research.	<p>There are major weaknesses of the research and resulting opportunities for additional research that can be identified by such a review.</p>	<p>Weaknesses include (1) a limited view of the cultural domain, (2) not considering the differential intensity of cultural variables across countries, (3) treating culture simplistically, and (4) over reliance on a value dimensional culture definition.</p>

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Table 2 (continued)

Author (date)	Summary	Hypotheses	Results
Jiang and Kim (2000)	In the U.S. style of corporate governance, outside investor monitors managerial performance primarily through the control mechanisms of managerial incentive contracts, independent outside directors and corporate takeovers. In contrast, in the Japanese style of corporate governance in which cross-corporate shareholding is common, managerial performance is monitored by cross-corporate governance, such as main banks and affiliated companies with whom managers share strategic information. Using a large sample of Japanese firms, this paper examines the informational role of cross-corporate interlocking ownership in Japan.	The general hypothesis is that as the level of cross-corporate ownership increases, there will be less information asymmetry between the firm and market participants, and thus stock prices of firms with high cross-corporate shareholdings incorporate information about future profitability earlier than do stock prices of firms with low cross-corporate shareholdings.	Results support the hypothesis, suggesting that cross-corporate shareholdings are an important institutional factor that helps alleviate the information asymmetry in the Japanese equity market.
Kemsley (1998)	Study examines whether a binding foreign tax credit is an incentive that significantly affects MNCs' decisions concerning their relative proportion of exports to foreign production. Regression analysis is adopted to test the sample drawn from Compustat for the period 1984–1992, as well as for a sample drawn from Corporate Taxes-A Worldwide Summary and the U.S. Department of Commerce's 1982 and 1989 Benchmark Surveys of U.S. Direct Investment Abroad.	<p>H1: There is a positive cross-sectional relation between the ratio of export sales to foreign sales and METI, and this relation only exists among firms with average foreign tax rates above the U.S. tax rate.</p> <p>H2a: The greater the tax rate in a specific foreign country, the greater the proportion of aggregate exports versus aggregate foreign production sales MNCs use to serve that foreign country market.</p> <p>H2b: The positive relation between ratios of exports to foreign sales and country-specific tax rates is stronger after TRA86 than before the act.</p>	<p>H1: Supported</p> <p>H2: Supported</p> <p>H3: Supported</p> <p>The results suggest that the marginal costs of changing production location often are lower than the marginal costs of adopting alternative tax-planning strategies, such as income shifting.</p>

Kirsch et al. (2000)	This paper examines the entry of the Big Six international accounting firms into emerging foreign markets and explores how they develop and expand their business once established in those markets. The study is based on survey data (supplied by the Big Six) regarding their penetration of the People's Republic of China, the Commonwealth of Independent States, and Central Europe. A conceptual model is employed to illustrate the interrelationship among a firm's specific characteristics, the foreign environment, and foreign subsidiary intrafirm structure.	The questionnaire was divided into sections to elicit information and opinions on (a) location-region, countries, and cities in which operations in the geographic regions of interest are located; (b) motivation for entry into audit markets of these regions; (c) profitability and return on investment benchmarks; (d) organizational structure of foreign offices; (e) types of services provided, promoted and marketed; and (f) the role of each firm in the development of the local accounting profession and standard setting processes.
Klassen et al. (1993)	Uses a final sample from Compustat of 191 U.S. MNCs who experienced worldwide relative changes in income tax rates for the period 1984–1990. Attempts were made in the regression analysis to control for the effects of the underlying profitability, geographic area, size, and multinationality of the sampled MNCs.	Finds evidence consistent with TRA86-induced geographic income shifting from Canada to Europe during 1984–1986 and then into the United States from all countries during 1986–1987.
Krivogorsky, 2000	Investigates the relation between corporate ownership structure and corporate control using a survey of 312 newly privatized firms from 12 different industries in Russia.	The initial attempts in Russia to separate ownership and control in order to increase managers' incentives to be concerned about accounting numbers have not been successful.

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Table 2 (continued)

Author (date)	Summary	Hypotheses	Results
Lau and Tam (1998)	The three-way interaction among budget emphasis, budgetary participation, and task difficulty affecting managerial performance is investigated for cultural effects. A sample of 189 Australian and Singaporean financial services sector managers provided survey responses.	H1-H3: These are not international H4: National culture does not affect the interaction among budget emphasis, budgetary participation, and task difficulty	All hypotheses are supported. No cultural effects on the relationship between evaluative styles and performance were found.
Lin and Hui (1999)	Adopting a management coordination perspective, this paper compares the relative performance of the lean and mass organization systems under different market environments and organizational operating conditions. Results from an empirically based computer model suggest that the success of either organization system depends not only on the organization's structural characteristics for management coordination, but also on internal and external environmental conditions. This study cautions against rushing into lean management practices.	H1: The lean organization system is more effective when operating under an unpredictable market environment, but the mass organization system is more effective when operating under a predictable market environment. H2: The lean organization system is more affected by communication breakdown than the mass organization system. H3: The lean organization system is more affected by turnover than the mass organization system. H4: The lean organization system responds to time pressure more effectively than the mass organization system. H5: The lean organization system responds to time pressure more efficiently than the mass organization system.	H1: Supported H2: Not supported H3: Supported H4: Weakly supported H5: Supported

Luo et al. (2001)	This study compares the control performance relationship for foreign versus local parents in international JVs in China. Transaction cost analysis is found to be more applicable to foreign parents than to Chinese parents. Both overall and specific controls are associated with performance for foreign parents, while only specific control is associated with performance for Chinese parents. Under goal incongruity, Chinese parent control is associated with foreign parent dissatisfaction with venture performance, but not vice versa.	H1: (a) Both specific control and overall control are positively related to foreign parent satisfaction with IJV performance. (b) Only specific control is positively related to Chinese parent satisfaction with IJV performance. H2: (a) Under goal incongruity, Chinese parent control is inversely associated with foreign parent satisfaction with IJV performance. (b) While foreign parent control is not associated with Chinese parent satisfaction with IJV performance. H3: (a) When the equity stake is higher, there is a stronger positive relationship between control and performance for foreign parents. (b) but not for Chinese parents. H4: (a) When the organizational competence a parent commits to the venture is superior, there is a stronger positive relationship between control and performance for foreign parents. (b) but not for Chinese parents. H5: (a) When the cultural distance from the host country is higher, there is a weaker positive relationship between control and performance for foreign parents. (b) but not for Chinese parents.	H1: (a) Supported; (b) supported H2: (a) Supported; (b) supported H3: (a) Supported; (b) supported
Luo et al. (2001)		H4: (a) Supported; (b) not supported H5: (a) Not supported; (b) not supported Having a majority stake improves performance from the foreign parent's perspective, but not from that of the Chinese parent.	H4: (a) Supported; (b) not supported H5: (a) Not supported; (b) not supported
Merchant et al. (1995)	This paper explores differences between U.S. and Taiwanese firms in measuring, evaluating, and rewarding profit-center managers. Four research propositions are developed based on a review of existing research concerning differences in national culture.	H1: Taiwanese firms offer smaller individual performance-dependent monetary rewards than do U.S. firms. H2: For the performance-dependent rewards they give, Taiwanese firms are more likely to base the rewards on group, rather than individual, performance than are U.S. firms.	H1: Not supported H2: Not supported H3: Supported H4: Not supported

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Table 2 (continued)

Author (date)	Summary	Hypotheses	Results
Nagy and Neal (2001)	This paper examines the management myopia issue by comparing the level of income smoothing that occurs between U.S. and Japanese companies. A system of simultaneous equations is employed to measure the extent to which management uses discretionary accruals and research and development investments to smooth income.	<p>H3: As compared to U.S. firms, Taiwanese firms make less use of long-term incentives (i.e., those based on performance measured over periods longer than 1 year).</p> <p>H4: Relative to U.S. firms, performance evaluation of profit-center managers in Taiwanese firms is more subjective.</p> <p>H1: The degree of income smoothing through the use of discretionary accruals differs between U.S. and Japanese companies.</p> <p>H2: The degree of income smoothing through the timing and amount of research and development investments differs between U.S. and Japanese companies.</p>	<p>H1: Weakly supported</p> <p>H2: Supported</p> <p>The results suggest that while both Japanese and U.S. managers engage in some amount of myopic behavior (i.e., smooth income), Japanese managers do so at a significantly higher level.</p>
Nishimura (1995)	Successful transportation of Japanese management accounting practices, such as target costing, horizontal management employee relationships, and zero-lead time, requires a match between national culture and organizational culture. Firms in both the West and Far East engage in decentralized decision making. However, Japan's national culture is geared towards collectivism (low individualism) and strong loyalty ties between family and company, which allows Japanese firms to employ an organizational culture, such as daily lunch between managers and employees, an absence of paid holidays, and long hours without overtime that serves as a control mechanism of employee behavior. Such a match is necessary for successful transplantation of Japanese management practices to non-Japanese countries.	<p>The general hypothesis is that countries in which Japanese management practices have been successfully transplanted possess a national culture similar to the national culture existing in Japan.</p>	<p>Analysis of survey data from the Japan External Trade Organization (JETRO) of 338 companies suggests that countries with a national culture similar to Japan's are more successful (e.g., higher ROI) than countries with national cultures dissimilar to Japan's in transplanting Japan's organizational culture in the form of Japanese management accounting practices, such as target costing (genka kaizen) and visual management (Kanban—zero lead times).</p>

Noerrekliit and Schoenfeld (2000)	Controlling multinationals with managerial accounting often is inefficient. Language, external variables, and headquarters' decisions create distortions that prevent comparison with domestic data and require subsidiary accounting adjustments. Furthermore, background and national cultural value systems let individuals perceive and react nonuniformly to similar issues. Therefore, steps are needed to assure cross-cultural understanding for communications.	N/A	The paper argues that some accounting problems may be communications based. The paper describes a method to enhance understanding in cross-cultural management. This is demonstrated for the management accounting, control, and performance evaluation process.
Picciotto (1992)	Since the early 20th century, tax authorities have been concerned with preventing manipulation of transfer prices between related firms, especially within transnational corporate groups (TNC's). By the 1930s, most states had introduced a broad power to adjust such prices to conform with the "arm's length" criterion since it was felt that either the application of national taxes directly to foreign parent or subsidiary companies or taxation on a unitary or consolidated basis would exacerbate overlapping or double taxation.	N/A	Both theory and detailed examination of practice show that, in most cases, the arm's-length criterion cannot be applied on the basis of "market" prices since the raison d'être of an integrated firm is economies of scale and scope and generation of synergy profits.
Salter and Sharp (2001)	This paper explores the effect of an apparently small difference in national culture on the ability of agency theory to explain escalation of commitment to failing projects in two countries (United States and Canada) with significant cross-border investment.	H1: A small but statistically significant increase in individualism increases the effect of adverse selection conditions (information asymmetry and the incentive to shirk).	H1: Supported. The effect of adverse selection conditions is significantly stronger among managers from the more individualist United States. Also, more experienced managers are less likely to escalate commitment than less experienced managers. The implications of these findings for the design of control systems in U.S. Canada cross-border subsidiaries are discussed.

(continued on next page)

Table 2 (continued)

Author (date)	Summary	Hypotheses	Results
Schuler and Rogovsky (1998)	This paper investigates whether national culture impacts the methods of human resources management. By developing culture-specific propositions for four categories of compensation practices based on status, performance, social benefits and programs, and employee ownership plans, an attempt is made to determine the extent to which Hofstede's (1967) four dimensions of culture are associated with specific compensation practices.	The paper presents 19 hypotheses concerning various performance evaluation schemes and Hofstede's (1967) four dimensions of culture.	The majority of hypotheses are supported. The implications of these findings for the management of human resources by multinational firms are discussed.
Sharp and Salter (1997)	Previous research suggests that aspects of agency theory and prospect theory explain decisions to escalate commitment to failing projects. The willingness of North American and Asian managers to escalate commitment to losing projects is measured using four go/no-go decision cases.	<p>H1: The effect of agency conditions (the presence of an incentive to shirk and asymmetrical information) on project-escalation decision is smaller in Asia than North American</p> <p>H2.1: Asian managers are more willing to escalate projects than North American managers.</p> <p>H2.2: The effect of negative framing on project-escalation decision is greater in Asia than North America.</p>	<p>H1: Supported</p> <p>H2.1: Not confirmed</p> <p>H2.2: Not supported</p>
Tsui (1996)	This study examines the relationship between ethical reasoning and ethical behavior of Hong Kong auditors. Using Hofstede's (1967) theory of cultural differences, the study tests whether Hong Kong auditors report lower ethical reasoning scores than U.S. auditors. Fifty experienced auditors in four Big Six Hong Kong accounting firms participated in an experiment in which they made a decision on an auditor-client conflict situation.	<p>H1: The higher the <i>P</i> score, the less likely that the auditor would respond as acceding to the client's request in an audit conflict situation.</p> <p>H2: Hong Kong auditors will have lower <i>P</i> scores than U.S. auditors.</p>	<p>H1: Supported</p> <p>H2: Supported</p> <p>The results suggest that the degree of auditors' ethical reasoning and subsequent ethical behavior varies across cultures. Fewer decision rights might be allocated to the auditor if the MNE chooses an auditor with lower ethical reasoning who is more likely to accede to the MNE's requests.</p>

Tsui (2001)	<p>The behavior and attitudes of Chinese and Western managers towards budgetary participation are hypothesized to differ because of differences between Chinese and Western cultures. Chinese managers are from a high-collectivist, large power distance, and long-term orientation culture while Caucasian expatriate managers represent a culture that is low-collectivist, small power distance, and short-term orientation. Survey data were collected from 51 Chinese subunit managers in Xian, China and 38 Caucasian expatriate subunit managers in Hong Kong to measure the "availability" of broad scope and timely management information systems, budgetary participation, and their managerial performance. The paper develops hypotheses concerning the influence of culture on six aspects of budget-control practices in the United States and Japan. Data are collected through questionnaires from 70 manufacturing companies in the United States and 149 manufacturing companies in Japan.</p>	<p>H1: The interaction effects of managerial accounting systems (MAS) and budgetary participation on managerial performance will be different depending on the cultural background of managers. High levels of budgetary participation will be associated with a negative relationship between MAS and managerial performance for Chinese managers but will be associated with a positive relationship for Western managers.</p>	H1: Supported
Ueno and Sekaran (1992)		<p>The paper presents 10 hypotheses concerning budget-control practices (e.g., planning, slack, evaluation time horizon, etc.) and several of Hofstede's (1967) cultural dimensions (e.g., individual-collectivism, uncertainty avoidance, etc.).</p>	<p>Most hypotheses are supported and indicate that the individualism-collectivism dimension explains why U.S. compared to Japanese companies, tend to use communication and coordination more extensively, build in budget slack to a greater extent, and use long-term performance evaluations to a lesser extent.</p>
Ueno and Wu (1993)	<p>This study employs a survey approach to examine the influence of culture on budgetary control practices of large manufacturing firms in the United States and Japan.</p>	<p>H1: U.S. companies use formal communication and coordination in the budget-planning processes to a greater extent than Japanese companies. H2: Japanese companies use broad time horizons in budget processes to a greater extent than in the U.S. companies. H3: Japanese companies structure budget-planning processes to a greater extent than U.S. companies.</p>	<p>Found support for hypotheses based on the cultural dimension of individualism collectivism. H1: Supported H2: Not supported H3: Not supported H4: Supported H5: Supported H6: Supported</p>

(continued on next page)

Table 2 (continued)

Author (date)	Summary	Hypotheses	Results
Whitley (1999)	Four characteristics of control systems differ considerably between institutional contexts. These characteristics are (1) the extent to which control is exercised through formal rules and procedures, (2) the degree of control exercised over how unit activities are carried out, (3) the influence and involvement of unit members in exercising control, and (4) the scope of the information used by the control system in evaluating performance and deciding rewards and sanctions. These four characteristics can be combined to constitute four distinct types of control system: bureaucratic, output, delegated, and patriarchal.	<p>H4: U.S. companies build slack into budgets to a greater extent than Japanese companies.</p> <p>H5: U.S. companies practice controllability of budgets to a greater extent than Japanese companies.</p> <p>H6: Japanese companies use long time horizons for performance evaluation to a greater extent than U.S. companies.</p> <p>The general hypothesis is that firms' management control system characteristics are closely linked to broader patterns of work organization, strategic decisions, variations in the nature of firms, and the political, financial, labor, and cultural systems in which firms operate.</p>	<p>The type of system characteristics used by the firm to control employee behavior depends on the firm's environment.</p>

Wijewardena and De Zoysa (1999)	This descriptive study is based on the findings of a survey conducted with large manufacturing firms in Australia and Japan during 1997. Overall, the survey results reveal a number of important differences between the two countries.	N/A	Australian companies emphasize cost-control tools at the manufacturing stage. However, Japanese companies emphasize cost planning and cost reduction tools at the product-design stage. Further, Japanese companies introduce more frequent changes to management accounting practices than their Australian counterparts.
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An international investigation of associations between societal variables and the amount of disclosure on information technology and communication problems: The case of Y2K

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Abstract

This study examines the association between five societal variables—political and civil system, cultural values, type of legal system, level of economic development, and equity market features—and the amount of corporate disclosure on the Year 2000 (Y2K) technological dilemma. Data are collected from the 1997/1998 fiscal-year annual reports of 1618 publicly listed firms spanning 17 nations. Empirical findings indicate the amount of Y2K disclosure varied significantly across national boundaries. Statistical analysis indicates a strong positive association between the amount of Y2K disclosure and the level of (a) political rights and civil liberties and (b) economic development. Results also imply publicly listed firms in Common Law nations disclose more Y2K information than counterparts in Roman-German Law nations. Of Hofstede's [Hofstede, G. (1980). *Culture & consequences. International differences in work-related values*. Beverly Hills, CA: Sage Publications] four cultural dimensions, only power distance is a significant explanatory factor of variations in the amount of Y2K disclosure.

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Keywords: Information technology and communication problems; Disclosure practices; Societal variables; International accounting

1. Introduction

Globally, organizations are increasingly dependent upon information technology and the interconnectedness—both internally and externally—of networks and systems. Despite

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offering numerous benefits, dependence and interconnectedness intensify the risks from various current information technology and communication (ICT) problems that continue to evolve. Information sharing and disclosure is viewed as an intricate part of a strategic plan to effectively (a) counter ICT risks, (b) minimize their impact, and (c) reduce their growth (Bray, 1999). Evidence of the extent of firm disclosure on ICT problems is primarily anecdotal evidence, with data generally drawn from the United States or United Kingdom. Empirical investigations of factors explaining ICT disclosure practices are virtually nonexistent. Given these factors, two principal objectives, therefore, emerge. The first objective is to provide a large scale international archival evidence on the extent of disclosure by firms on the Year 2000 (Y2K) dilemma. Since Y2K is perhaps the most significant ICT problem with significant global implications we have faced, an analysis of firm disclosure on this issue offers a large potential database. The second objective is to empirically test the association between the amount of Y2K disclosure and five societal variables¹ (political and civil system, cultural values, type of legal system, level of economic development, and equity market).

Origins² of ICT problems generally vary (Webster, 1999) while their effects, costs, and consequences show numerous similarities (see Appendix A). Financial and social incentives may induce corporate management to disclose information on the effects, costs, and consequences of ICT problems. Direct financial remediation costs (including prevention and clean-up costs) associated with a given ICT problem could be quite substantial.³ Threat of fiduciary legal claims for failing to disclose information of a material nature, therefore, may provide an impetus for disclosure of more ICT-problem-related information. Delays in investments into value-added projects, or a need to acquire additional equity or debt financing, may be an extra financial consequence of an ICT problem (Goldberg, Davis, & Pegalis, 1999). This could affect future cash flows and solvency, and/or the rights of a firm's current shareholders and creditors. Corporate management, therefore, may be spurred into disclosing more information to protect the firm's reputation, to inspire confidence in stakeholders, and to reduce the costs of capital. Questions about possible debt-covenant breeches may also arise. Corporate management, therefore, has the incentive to provide information on ICT problems to protect future employment prospects. Additional disclosure information on ICT problems may be provided with the aim of reducing the perceived risk of the firm. At a social level, corporate management may perceive it as their social responsibility to preserve social cohesion and cooperation that could result from a serious ICT problem (Petersen, Wheatley, & Kellner-Rogers, 1998). An effective communication plan may help maintain a firm's social contract with society, encourage confidence among end-users, and improve

¹ Societal variables are defined as "factors to which all enterprises within a particular country are subject and which vary between nations" (Thomas, 1991, p. 42).

² Origin refers to the method by which an ICT problem is developed and method introduced into the firm.

³ Costs for an individual firm to rectify ICT problems can be quite substantial. In the case of Y2K, direct worldwide costs were estimated to have been between US\$300 and 450 billion (Wolf, 2001). If indirect costs were included, expenses were estimated to have potentially exceeded US\$1.6 trillion (International Y2K Cooperation Center (IY2KCC), 2000). For some individual firms (i.e., Bank of America and General Electric), total Y2K remediation costs alone were between US\$400 and 500 million.

the firm's general image. Finally, ICT problem disclosures can avert the scrutiny by special interest groups and adverse intervention by regulatory agencies.

Data for this study were collected from the 1997/1998 annual reports⁴ of 1618 publicly listed firms from 17 nations. The results of an empirical analysis of the content indicate that the mean amount of Y2K disclosure varied significantly across national boundaries. Analytical tests find a significant association between five societal variables (political and civil system, cultural dimension of power distance, legal system, level of economic development, and equity market size) and the amount of Y2K disclosure. Firm size, industry type, listing status, and national Y2K materiality costs are also significant explanatory factors. The cultural dimensions of uncertainty avoidance, individualism and masculinity, turnover of the equity market, and a firm's economic performance, however, were not associated with the amount of Y2K disclosure. These findings imply that despite growing internationalization, international implications of Y2K, and extensive international media and scholarly coverage, there was a lack of consensus on Y2K disclosure practices across national boundaries. Based on these findings, I expect an asymmetry of information concerns across national boundaries for other ICT problems. The findings also indicate that factors associated with variations in other disclosure practices across national boundaries are of significant explanatory power. This implies that societal variables, such as the legal system and level of development, could have broader application to patterns of disclosure to traditional and emerging international accounting issues.

The remainder of this paper is arranged as follows. A general overview of international accounting-disclosure research followed by the development of testable hypotheses is provided in Section 2. The research method and descriptive statistics are outlined in Section 3, with results in Section 4. Discussion, concluding remarks, and future research ideas are provided in Section 5.

2. Prior international accounting-disclosure studies and the development of hypotheses

2.1. Overview of the prior general international accounting literature on disclosure practices

Salter (1998) argues that, despite a lengthy history, international accounting-disclosure research is relatively thin in content and largely incomplete. Nonetheless, research findings infer that corporate disclosure practices vary significantly across national boundaries. Alford, Jones, Leftwich, and Zemijewski (1993) analyze the relationship between

⁴ Two additional reasons support this restriction. First, the 1997/1998 fiscal year approximately marked the midpoint between the start of remediation action and the primary Y2K rollover date; thus, firms should have been in a position by this time period to report on the Y2K issue. Second, Y2K disclosure practices prior to 1997/1998 cut-off date were generally voluntary. Subsequently, some nations introduced mandatory requirements. As the disclosure of information on other ICT problems remains predominantly voluntary, the analysis of Y2K disclosure practices at a time when it was still largely voluntary provides better justification when generalizing findings to encompass disclosures on other ICT problems.

variations in the capital markets of 16 developed nations and the differences in the usefulness of accounting earnings. They conclude that the relative information content of corporate disclosures vary across national boundaries.⁵ Drawing on data from 17 nations, Ball, Kothari, and Robin (2000) focus on the association between the legal system and information asymmetry. Empirical results suggest that institutional features strongly influence disclosure practices (Ball et al., 2000). The nonfinancial accounting disclosures' empirical findings indicate that these are significant variations across national boundaries. Adams, Hill, and Roberts (1998) find significant variations across national boundaries in the amount of environmental and social information disclosed by firms in six European nations. Similarly, Williams (1999) shows that the quantity and quality of environmental and social disclosures in annual reports of firms from seven Asia-Pacific nations vary significantly across national boundaries.

Studies show that country-of-origin is a significant explanatory factor of variations in financial and nonfinancial accounting. However, results show that patterns in financial and nonfinancial disclosure across national boundaries may not coincide. Meek, Roberts, and Gray (1995) show that the amount of financial, nonfinancial, and strategic information multinational firms from the United States, United Kingdom, and continental Europe (France, Germany, and the Netherlands) varies significantly across national and regional boundaries. They show that continental-European multinational firms have more strategic information disclosure but less amount of financial and nonfinancial information than U.S. or U.K. multinationals.

Theoretical frameworks developed to explain variations in corporate disclosure practices across national boundaries rely heavily on contingency and environmental-based models, which Cooke and Wallace (1990) call environmental-determinism models. Early models are historical in nature and focus on economic factors such as colonial ties, level of economic development, and education standards (e.g., American Accounting Association, 1977; Mueller, 1968). More recent models incorporate cultural patterns (e.g., Doupnik & Salter, 1995; Gray, 1988; Salter & Niswander, 1995) and factors of a nation's legal and political system (e.g., Jaggi & Pek, 2000; Salter & Doupnik, 1992), and financial markets (e.g., Alford et al., 1993; Riahi-Belkaoui, 1995).⁶ The research findings suggest that national culture, a nation's cultural, political economy, and economic (market) environment affect corporate disclosure. This study seeks to extend prior research by empirically testing the association between the amount of Y2K disclosure (as a proxy for ICT problems) and the five societal-level factors—political and civil system, cultural values, legal system type, level of economic development, and type of equity market.

2.2. Political and civil system

Prior research suggests that firms adjust corporate-disclosure practices in response to the number, type, and nature of stakeholders (Roberts, 1992). The development, power,

⁵ Specifically, the corporate disclosures in nations such as Denmark, Germany, and Italy were found to have less information value than corporate disclosures among firms in nations such as Australia, France, and the United States.

⁶ For a full description, refer to Cooke and Wallace (1990) and Doupnik and Salter (1995).

and influence of stakeholders, however, can be significantly influenced by a nation's level of political rights⁷ and civil liberties⁸ (Moaddel, 1994). By association, therefore, the political and civil system may also affect corporate disclosure practices (e.g., Belkaoui, 1983; Goodrich, 1986; Gray, 1988; Jaggi & Pek, 2000). In a geopolitical environment with more extensive political rights and civil liberties, emerging stakeholder groups are less likely to face obstacles to establish their identity and express a wider range of diverse ideas and views. Furthermore, special-interests groups, such as unions, environmentalists, and consumer groups, are likely to have greater freedom to scrutinize a firm's operations. Under these conditions, firms may adopt more transparent disclosure policies to meet the needs of a wider set of interest groups, maintain external relationships and image, and reduce regulatory scrutiny. Some authors (e.g., Gastil, 1990) argue, however, that the emergence of new stakeholder groups will not be stifled by a repressive political and civil system, but that their power and influence is likely to be seriously diminished. In a repressive political and civil system, power and influence is centralized towards one party or a few key individuals. With centralization, firms are likely to refine their disclosure strategies to meet the specific needs of a small (if not a single), concentrated group. In addition, consolidation of power and influence may enable firms to establish internal lines of communication through which specific financial reports may be provided and thus reduce the need to provide generalized financial reports to other parties.

In the context of Y2K, it was anticipated that affected firms will generate significant direct or indirect consequences on employees, customers, shareholders, and the general public. If prevailing circumstances enable the interests of these parties to be openly and vigorously represented by special groups, such as unions, consumer groups, and environmental factions, firms would be under greater pressure to make suitable disclosures. With a more repressive political and civil system, however, pressure to make Y2K-related disclosures was likely to have been diminished. Based on this analysis, the following testable hypothesis is developed:

Hypothesis 1. There is a negative association between the level of political and civil repression and the extent of Y2K disclosure in the annual reports of listed firms.

2.3. *Cultural values*

Theoretical frameworks suggest a significant association between culture and disclosure practices (e.g., Douppnik & Salter, 1993, 1995; Perera, 1989; Salter & Niswander, 1995; Zarzeski, 1996). The seminal work of Gray (1988) provides a valuable framework for analyzing this association. His model highlights this connection via the association between the cultural dimensions Hofstede (1980) (uncertainty avoidance, power distance, individualism, and masculinity) and accounting subcultural values. With respect to

⁷ Gastil (1990) defines political rights as an ability of individuals, firms, and other related bodies to play a part in determining the laws and government of the community. The concept captures political competitiveness, freedom to organize multiple political parties, rights of political opposition, and self-determination by major subgroups (Lin, 1993).

⁸ Civil liberties encompass freedom of assembly, demonstration, speech, and religion (Lin, 1993).

corporate disclosures. Gray (p. 11) hypothesizes that “the higher a country ranks in terms of uncertainty avoidance and power distance and the lower it ranks in terms of individualism and masculinity then the more likely it is to rank highly in terms of secrecy.”⁹

This hypothesis implies that societies with higher levels of uncertainty avoidance (a cultural dimension that defines a society’s level of comfort with uncertainty and ambiguity) disclose less corporate information. Information is restricted to avoid possible conflicts, competitive uncertainties, and to preserve greater internal security. The hypothesis of Gray (1988) also implies that information is likely to be more restricted in societies with higher levels of power distance (acceptance of institutional and organizational authority by society’s individual members). This is because in such societies, individual members are more willing to accept the restriction of information to the upper echelons of a firm, government, or agency. With respect to ICT problems, individuals in a high power-distance society may be more willing to accept a firm’s decision to restrict disclosures if corporate management fears disclosure could undermine its power. Individual in these societies, respect authority, and rely on the expertise of management in dealing with such matters.

The cultural dimension of individualism of Hofstede (1980) is considered synonymous with a higher level of spirited competition and entrepreneurship. Gray (1988) argues that a highly competitive environment encourages firms to disclose more information to adequately compete for capital. In a high-individualism society, the lack of disclosure on ICT problems may raise concerns about a firm’s future viability, leading creditors to restrict financing or to enforce stricter debt-covenant clauses. In addition, there is likely to be less reluctance among stakeholders (customers and suppliers) to shift allegiances if concerns about future services arise. Additional disclosure in an individualistic society may help preserve a relationship with and confidence in a firm. Finally, masculinity (society’s preference for assertiveness, high achievement, and financial success) is perceived to have a positive influence on corporate disclosure. Higher masculinity levels encourage society members (individuals or firms) to actively promote the disclosure of information about achievements, abilities, and successes. In the context of ICT problems, more disclosure may result when masculinity levels are higher with corporate management perceiving the need to assert their ability and aptitude for dealing effectively and efficiently with emerging problems.

Empirical findings generally support hypotheses underlying the theoretical framework of Gray (1988). Salter and Niswander (1995, p. 394) state “Gray appears to have provided a workable theory to explain cross-national differences in accounting structure and practice, which is particularly strong in explaining differential financial reporting practices.” Internationalization, however, may moderate the influence of cultural values. Jaggi and Pek (2000) and Zarzeski (1996) find that cultural values are not a significant

⁹ Secrecy and transparency is defined by Gray (p. 8) as “a preference for confidentiality and the restriction of disclosure of information about the business only to those who are closely involved with its management and financing as opposed to a more transparent, open and public accountable approach.” He hypothesized that “the higher a country ranks in terms of uncertainty avoidance and power distance and the lower it ranks in terms of individualism and masculinity then the more likely it is to rank highly in terms of secrecy” (p. 11).

explanatory factor of corporate disclosure practices among international firms. Since the link between culture and corporate disclosure practices is not conclusive, it is important to examine the influence of cultural dimensions on disclosure practices related to ICT problems, which generally transcend international boundaries. Consequently, the following hypothesis, derived from Gray's (1988) framework, is formed:

Hypothesis 2. The lower a country ranks in terms of uncertainty avoidance, power distance, and masculinity and the higher it ranks in terms of individualism, the more Y2K information will be reported by listed firms in their annual reports.

2.4. Level of economic development

Conceptual accounting studies investigating the influence of sociopolitical and economic systems identify economic factors as important determinants of the development of accounting and reporting practices (Belkaoui, 1983; Belkaoui & Maksy, 1985; Cooke & Wallace, 1990; Nair & Frank, 1981). The level of economic development is an economic factor of particular interest (Adhikari & Tondkar, 1992; Ahmed, 1995; Doupnik & Salter, 1995; Salter, 1998), with theoretical arguments implying a positive influence on corporate disclosures (Doupnik & Salter, 1995). Some suggest that this association arises because a higher level of economic development provides a positive stimulus that increases the range and strength of special interest groups. Moaddel (1994) argues that economic development benefits all stakeholders, which promotes growth in the number and strength of pressure groups such as labor unions and consumer groups. In addition, greater economic development enables better organized, financed, and articulated special interest groups. Overall, economic development is likely to see firms under greater scrutiny from a wider range of better equipped and funded special interest groups. In response, corporate management may adopt more transparent disclosure policies aimed at maintaining the firm's relationships and image and at avoiding more intense scrutiny and potential regulatory intervention.

Disclosure on ICT problems is likely to receive higher attention from special interest groups in nations with a higher level of economic development because a general by-product of economic development is the use of more complex ICT systems and sophisticated and extensive interconnected networks. For instance, the 1999 Information Society Index (ISI; IDC.com, 1999), measuring the ability of 55 nations to access and absorb ICT, shows that Sweden and the United States were ranked 1st and 2nd, respectively. Conversely, Malaysia and South Africa were ranked 32nd and 38th, respectively. Higher ICT adoption and interconnectivity implies that firms in more developed economies are likely to be prone to ICT problems. Due to the greater exposure to risk, these firms would be under more pressure from special interest firms to disclose information on ICT problems than their counterparts in less developed economies.

While theoretical arguments support a positive association between economic development and disclosure patterns, the empirical evidence is mixed: Adhikari and Tondkar (1992) and Ahmed (1995) find no association. Conversely, Cooke and Wallace (1990), Doupnik and Salter (1995), and Salter (1998) find support for theoretical arguments. Overall, the association remains an open empirical question. If the risk of ICT is likely to

be influenced by a nation's level of economic development, it is important to explore further the influence of this economic factor. Thus, the following hypothesis is formed:

Hypothesis 3. There is a positive association between the level of economic development and the extent of Y2K disclosure presented in annual reports of listed firms.

2.5. *Equity markets*

Findings from several surveys and empirical studies indicate that information on ICT problems, such as Y2K, are of importance to investors (e.g., Goldberg et al., 1999; Merrill Lynch Global Securities Research and Economics, 1998; McGough, 1999). For example, an international survey by Taylor and Associates (1999) ranks the disclosure of information on ICT risks high among investors' information needs. Interest in such information stems from a need to fully analyze the effect of an ICT problem on (a) future cash flows, (b) additional financing needs, and (c) potential postponement of previously proposed projects due to budgetary constraints (Webster, 1999).

Some limited prior empirical research attempts to analyze the association between the equity market and corporate disclosure practices across national boundaries. The empirical evidence of Barrett (1977) shows that differences in the extent of corporate disclosures between countries are explained, in part, by variations in the efficiency of the equity market.¹⁰ Two reasons may explain these results. The first reason stems from the size of the capital market. Specifically, as participants in capital markets increase, firms face more pressure for greater information (Adhikari & Tondkar, 1992; Ahmed, 1995). Doupnik and Salter (1995) state that a "strong equity market with a diverse group of shareholders has generally been viewed as conducive to the production of sophisticated information." The level of activity within the equity market provides the second underlying explanation of Barrett's (1977) findings. Doupnik and Salter (1995) argue that, as the level of activity increases, the information demands of stakeholders about a firm's activities that help to differentiate entities also intensify. With more competition for scarce investment capital, there is an incentive for firms to disclose more to the market (Ahmed, 1995). Given the interest of investors in information on ICT problems, analysis of equity-market features, such as size and turnover, that can influence disclosure practices appears prudent. Thus, the following hypothesis is formed:

Hypothesis 4. There is a positive association between the size and turnover of the equity market and the quantity of Y2K information presented in the annual reports of listed firms in the Asia-Pacific region.

2.6. *Legal system*

Because of the interconnectedness, legal actions are frequently seen to be a significant by-product of ICT problems (Webster, 1999). For example, while the threat of legal action

¹⁰ Barrett's study concluded that the quantity of corporate disclosure in the United Kingdom and the United States was much higher than that in Sweden, the Netherlands, Germany, France, and Japan.

itself may encourage corporate management to disclose information on ICT problems, the legal system within which the firm operates could also influence the amount of disclosure (Reid, 1998).

Jaggi and Pek (2000) suggest that the legal system is an important element of the institutional framework within which an accounting system interacts. Salter and Douppnik (1995) suggest that the effect of a legal system on accounting practices is influenced by the number of accounting rules determined by law. The influence of the legal system can be either direct or indirect (e.g., Douppnik & Salter, 1992; Jaggi & Pek, 2000). Direct influence may occur via such mechanisms as the Companies' Act in the U.K., accounting regulations, and tax laws. These direct mechanisms generally prescribe the basic requirements for the disclosure and the measurement of accounting information. Indirect influences arise because legal systems are a significant determinant of the development of corporate ownership arrangements, the structure of a corporation's capital, and the nature of capital markets (La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1997; La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1998). In turn, corporate ownership, corporate capital structure, and capital markets significantly influence disclosure practices (Jaggi & Pek, 2000).

International accounting research on the interaction between legal and accounting systems focuses on the differences between firms from nations within the Roman-Germanic legal family compared with those in the Common Law legal family.¹¹ Roman-Germanic Law is based on rules developed from ideas of justice and morality determined by legal scholars (Salter & Douppnik, 1992). Rules of law are designed to form a detailed framework for resolving legal issues. Generally, accounting standards, practices, and procedures are extensively codified in firm law or commercial codes (Jaggi & Pek, 2000). Conversely, in Common Law, the judiciary establishes principles and rules when providing judgments on specific disputes (Salter & Douppnik, 1992). Rules governing business entities are not traditionally prescribed in large numbers and details (Berkowitz, Pistor, & Richard, 2001). Under a Common Law legal system, accounting practices are predominantly determined by accountants and associated professional bodies and thus tend to be more adaptive and innovative (Jaggi & Pek, 2000).

It is generally hypothesized that the amount of disclosure in Common Law nations is likely to be greater than it is in Roman-Germanic Law nations. Jaggi and Pek (2000, p. 501) argue, "investors' and debtholders' information needs play an important role in financial disclosures, a widely dispersed ownership and a high level of debt financing. . . would place heavy demand on firms for detailed financial disclosures." In addition, La Porta et al. (1997, 1998) suggest that a Common Law system is more conducive toward the promotion of diversified corporate ownership structures and a wider use of debt financing. Consequently, firms from Common Law nations are likely to provide more corporate financial disclosure to meet the broader information needs of a wider set of shareholders and creditors. While empirical findings indicate that disclosure levels are

¹¹ Other recognized legal families having bearing in some nations include the Socialist, Hindu, and Islamic legal systems. Roman-Germanic Law and Common Law, however, remain the underlying legal systems in the majority of nations around the world, including the nations covered in this study. See David and Brierley (1985) and Zweigert and Kotz (1998) for a complete summary of legal families.

more extensive in Common Law nations relative to Roman-Germanic Law nations, the evidence remains relatively thin. With the potential for legal claims to emerge in the wake of ICT problems, an examination of the association between the legal system and disclosures related to ICT problems is highly relevant. Thus, the following testable hypothesis is proposed:

Hypothesis 5. Publicly listed firms from Common Law nations will report a higher amount of Y2K information in their annual reports than publicly listed firms from Roman-Germanic Law nations.

3. Research method

3.1. Source documentation and measure of total Y2K disclosure (TQY2K disclosure)

Annual reports for the 1997/1998 fiscal-year annual report are the primary source documentation used in this study.¹² Content analysis (e.g., Cooke, 1991; Gray, Kouhy, & Lavers, 1995; Hossain, Tan, & Adams, 1994) is used to measure the total amount of Y2K information. Abbott and Monsen (1979, p. 504) defined content analysis as “a technique for gathering data that consists of codifying qualitative information in anecdotal and literary form into categories to derive quantitative scales of varying levels of complexity.” Consistent with prior empirical research (e.g., Hackston & Milne, 1996; Ingram & Frazier, 1980), sentences form the underlying “unit of analysis.” After an extensive review of Y2K and ICT problem literature (e.g., Goldberg et al., 1999; Organization of Economic Cooperation and Development [OECD], 1998; Petersen et al., 1998; Webster, 1999; Yardeni, 1997), I constructed a checklist instrument to identify the sentences disclosing Y2K-related information. Then I pretested the preliminary checklist instrument in a pilot study, using annual reports not included in the analysis of this study. In the pilot study, four independent coders each reviewed a set of 15 annual reports. We discussed the differences arising from an initial review to find a consensus coding for conflicting sentences. Then, we amended the preliminary checklist instrument to reflect and clarify difficulties noted. We conducted a second test using another set of 15 annual reports (also not included in the final study’s analysis) and found few new differences. Consequently, we only made minor adjustments to the checklist instrument, with no further pretesting and revision deemed necessary.¹³ Calculating the total amount of Y2K disclosures (subsequently termed *TQY2K Disclosure*) using the final checklist instrument involved three steps: (1) before coding, each annual report is read in entirety to establish a primary understanding; (2) each sentence deemed consistent with the final checklist instrument is marked during a second review; and (3) marked sentences are then totaled. To ensure consistency in coding, two persons independently review all individual scores.

¹² Firms may use a variety of communication mechanisms to disclose information on Y2K. A survey of all communication mechanisms would yield a more complete picture. Nonetheless, such an analysis was pragmatically, financially, and technically infeasible.

¹³ The final checklist instrument can be obtained from the author upon request.

3.2. Control factors

Based on a review of the corporate disclosure and ICT problem literature, five control factors (firm size, industry type, economic performance, listing status, and materiality of national level Y2K costs) are included in the multiple-regression analysis. Larger firms are thought to be at greater risk of being affected by ICT problems (including Y2K). Larger firms have a greater need to invest in ICT to ensure that their dispersed operations and interaction with a wider scope of external stakeholders are conducted more effectively (e.g., OECD, 1998). Industry sectors that rely heavily on ICT are also likely to be at greater risk to problems, such as Y2K, than less dependent and interconnected industries (OECD, 1998). More highly exposed business sectors include telecommunication, airline transportation, financial, and computer manufacturing industries (Reuters, 1999). With higher exposure threats, larger firms and those in high-risk industry sectors are likely to disclose more ICT problem information.

Economic performance may also influence disclosure levels. Relative to poor-performing firms, strong economic performers are likely to signal the availability of financial resources at their disposal to address ICT problems. Empirical research also identifies a positive relationship between a firm's foreign-listing status and the extent of corporate disclosure (e.g., Cooke, 1991; Malone, Fries, & Jones, 1993). Multilisted firms (foreign and domestic exchange listing) are the subject of scrutiny from a wider set of stakeholder groups. In response, multilisted firms may disclose more information than domestically listed firms to meet the information needs of a broader group of stakeholders and interests. Finally, variations in Y2K disclosure practices across national boundaries could arise from differences in the perceived impact of such ICT problems in different nations (e.g., Goldberg et al., 1999; OECD, 1998; Webster, 1999).

3.3. Proxy measurements for the societal variables and control factors

Proxy measures used to represent each societal variable and control factor are consistent with prior international empirical research. Table 1 summarizes each respective proxy measure.

3.4. Sample selection: nations and firms

Sample firms are drawn from nations where the information needed to construct proxy measures for the respective societal variables is available. Forty-nine nations, with scores for the cultural dimensions of Hofstede (1980), formed the preliminary list of nations from which firms were drawn. A fourfold criterion is then applied to screen the preliminary national list: (1) data availability (for remaining) for proxy measure related to other societal variables; (2) sufficiently large number of publicly listed firms, with principal headquarters in the specified nation;¹⁴ (3) annual reports published in English;¹⁵ and (4) an

¹⁴ This set of criteria is applied to avoid a potentially lopsided representation.

¹⁵ Financial limitations did not allow for the translation of non-English annual reports. English is the first-language of the researchers.

Table 1

Summary description of the societal variables and control factors included in the study

Description societal/ control variables	Predicted direction	Description of measurement technique of societal variables and control factors
PCS (political and civil system)	Negative	Extent of political freedom and civil rights in each nation as measured by Freedom House (1998), based on an index developed by Gastil (1978).
IND (individualism)	Positive	Degree to which the members of a society are not interdependent, as opposed to collectivism, in which people are organized into strong groups. Original cultural-dimension scores for each nation gathered from Hofstede (1980).
PD (power distance)	Negative	Represents the extent that people tolerate unequal distributions of power within a society. Original cultural-dimension scores for each nation gathered from Hofstede (1980).
UA (uncertainty avoidance)	Negative	This dimension represents the extent to which a society feels threatened by unknown and ambiguous situations. Original cultural-dimension scores for each nation gathered from Hofstede (1980).
MAS (masculinity)	Positive	The degree to which people within a society express the need for achievement, heroism, assertiveness, and material success versus societies that stresses relationships, modesty, caring for the weak, and quality of life. Original cultural-dimension scores for each nation gathered from Hofstede (1980).
LGDP (level of economic development)	Positive	Nation's mean gross domestic product in US\$ for the three periods prior to 1997 as reported in the <i>World Development Report</i> (World Bank, 1995–1997).
ECGDP (market capitalization to GDP)	Positive	Mean market capitalization in US\$ divided by the nation's gross domestic product in US\$ for the three periods prior to 1997 as reported in the <i>World Development Report</i> (World Bank, 1995–1997).
TRP (trading volume to market capitalization)	Positive	Mean trading volume as a percentage of the market capitalization for the three years preceding 1997 for each nation as gathered from the <i>Emerging Stock Market Factbook</i> (International Finance Corporation, 1995–1997) and <i>Stockmarket Factbooks</i> for various exchanges internationally.
LS (legal system)	Positive	Classification of each nation into one of two legal families: (1) Common Law; and (2) Roman-Germanic Law.
LTAS (firm size)	Positive	Natural log of the average total assets of each firm in US\$ for 1996 and 1997.
ROA (economic performance)	Positive	Average return on assets of each firm for 1996 and 1997.
HILO (exposure of industry to Y2K)	Positive	Classification using a dummy variable where a firm from an industry highly exposed to the Y2K problem, as based on OECD (1998) classification, were coded with a one (1); otherwise a zero (0).
List Stat (listing status of the firm)	Positive	Classification using a dummy variable where a firm listed on a domestic and foreign stock exchange, were coded with a one (1); if domestically listed, only coded a zero (0).
LECOST (national materiality of Y2K cost)	Positive	The estimated total cost in US\$ of rectifying the Y2K problem in each nation, as projected by leading commentator groups such as Gartner, at mid-1998 divided by the nation's gross domestic product in US\$ for the three periods prior to 1997 as reported in the <i>World Development Report</i> (World Bank, 1995–1997).

Table 2
Descriptive statistics of the entire sample with a breakdown by nation

Nation	Demographic statistics of sample					
	Mean total assets (US\$ billions)		Mean operational revenue (US\$ billions)		Average return on assets	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Australia	5.88	17.14	4.95	6.144	7.17	13.42
Canada	8.85	12.18	7.95	11.28	7.59	6.52
Denmark	4.37	8.794	4.20	10.94	8.02	10.76
Finland	1.53	3.565	3.02	2.299	4.07	7.89
France	3.91	15.27	6.14	3.067	3.86	6.67
Germany	6.64	3.147	3.20	8.755	6.65	6.09
Hong Kong	3.69	10.26	5.40	15.18	8.99	7.19
Japan	9.70	12.22	12.06	16.42	2.17	7.89
Malaysia	1.95	3.189	5.21	20.04	9.64	9.21
Netherlands	1.93	1.513	9.11	21.89	9.42	8.36
New Zealand	2.45	5.361	4.30	10.89	8.91	6.96
Norway	1.49	6.156	3.69	9.155	1.19	11.30
Singapore	1.97	3.084	4.65	10.62	8.46	7.96
South Africa	4.21	12.47	1.37	1.962	2.51	8.91
Sweden	4.95	15.64	2.09	4.197	5.45	2.30
United Kingdom	7.00	15.77	4.67	7.843	7.71	6.60
United States	14.10	14.57	15.30	17.01	8.98	6.87
Total sample	5.33	9.81	6.59	11.38	6.43	7.88

established stock exchange. This screening reduced the preliminary national list to 22 nations. A list of firms listed on the major stock exchange of the 22 nations at the end of 1997 is then drafted. To minimize undue exogenous influences, foreign-listed firms (those without primary headquarters in the nation where a listing appears) are excluded from each national list of publicly listed firms. Requiring a sufficiently large survey sample from each nation for purposes of statistical analysis, 150 firms from each national list (i.e., 150 firms from each of the 22 nations)¹⁶ are randomly selected. Various techniques, including direct contact, searches of annual report databases and archives, and a firm's Web site, are used to collect the required source documentation. We excluded firms from Belgium, Indonesia, Italy, South Korea, and Taiwan from the final analysis because a small number of firms met the screening criteria. The final number of usable annual reports included in the statistical analysis totaled 1618, distributed across 17 nations.¹⁷ Table 2 reports the basic descriptive statistics (total assets, turnover, and return on assets) while Table 3 reports the frequency (Panel A) and average amount of Y2K disclosure (Panel B). Each table includes breakdown by nation.

A review of Table 3 provides some interesting observations. Frequency rates (see Table 3, Panel A) imply significant variations across national boundaries. For example, more

¹⁶ In New Zealand and Finland, publicly listed companies numbered fewer than 150 (122 and 129, respectively). Consequently, data from all publicly listed companies in these nations were sought.

¹⁷ Analytical tests were conducted in an effort to establish if there was any nonresponse bias. Findings of these tests did not reveal any nonresponse bias among those firms from whom annual reports were collected relative to those from whom the source documentation could not be acquired.

Table 3

Breakdown of the frequency and amount of disclosure on Y2K

Nation	(A) Frequency of disclosure			(B) Demographic statistics of sample		
	Number of usable annual reports	Number of firms disclosing	% Firms disclosing	Mean number of sentences	S.D.	Maximum number of disclosures
Australia	113	94	84.07	8.0973	6.5547	87.00
Canada	96	71	75.00	5.1250	4.8758	51.00
Denmark	48	28	62.50	2.8542	3.8204	44.00
Finland	87	43	52.87	3.8966	5.3852	21.00
France	95	64	69.47	5.1053	5.3960	21.00
Germany	106	67	63.21	3.7925	3.9418	38.00
Hong Kong	111	33	29.73	2.4144	4.7701	15.00
Japan	128	39	30.47	2.3047	4.5516	23.00
Malaysia	94	13	14.89	1.1789	3.6143	12.00
Netherlands	71	42	59.15	3.1127	3.4291	33.00
New Zealand	66	24	37.88	2.4394	4.7268	45.00
Norway	94	65	69.15	5.5532	5.9507	55.00
Singapore	109	24	22.02	1.8165	4.3994	21.00
South Africa	83	59	71.08	6.8675	6.8978	35.00
Sweden	93	47	52.69	3.8925	5.2097	50.00
United Kingdom	106	84	79.25	7.2830	6.3467	67.00
United States	117	105	90.60	9.4701	6.6651	78.00
Total sample	1618	902	56.68	4.5482	5.7698	87.00

than 90% of sample firms from the United States provide at least one sentence of Y2K disclosure. Conversely, in Malaysia, the frequency rate is slightly less than 15%. The mean amount of Y2K disclosure also suggests sizeable variations across national boundaries (see Table 3, Panel B). Again, the United States and Malaysia have the highest and lowest averages. Finally, regarding Table 3, Panel B, two major generalizations are highlighted: (1) firms in developed nations (i.e., United States, Australia, and United Kingdom) provide more Y2K disclosure than firms in emerging economies (e.g., Malaysia); and (2) Y2K disclosure is higher in Common Law nations than Roman-Germanic nations. Independent *t* and ANOVA tests (not reported in this paper)¹⁸ subsequently performed support these two broad generalizations. These general findings provide anecdotal evidence supporting Hypotheses 3 and 5.

4. Statistical results

4.1. Correlations

Computed Pearson correlations did not exceed .5 (see Table 4). Farrar and Glauber (1967) argue that bivariate correlation values above .8 (also, see Hair, Anderson, Tatham,

¹⁸ Tests were all statistically significant at the 1% confidence level.

Table 4
Pearson correlation results

Variables	IND	PD	UA	MAS	GDP	ECGDP	TRP	LS	LTAS	ROA	HILO	List Stat	LECOST
PCS	-.088	.085	-.349	.133	-.365	.334	-.073	.397	.073	.010	-.323	.021	-.177
IND	1.000	-.271	.247	-.116	.395	-.478	.035	-.073	-.076	-.010	.338	-.031	.212
PD		1.000	-.056	.238	-.087	.319	-.154	.292	.100	.002	-.333	-.011	.072
UA			1.000	.342	.317	-.376	-.301	-.345	.149	.004	-.023	-.051	.354
MAS				1.000	.245	.302	.144	.376	.306	-.013	-.173	.002	.318
LGDP					1.000	-.356	.354	-.105	.318	-.006	.131	.115	.354
ECGDP						1.000	-.246	.199	.101	-.006	-.258	-.078	-.246
TRP							1.000	-.298	-.035	.051	.087	-.032	.277
LS								1.000	.026	-.023	-.126	.310	-.028
LTAS									1.000	-.121	.090	.410	.340
ROA										1.000	.020	.191	-.003
HILO											1.000	.036	.048
List Stat												1.000	.091
LECOST													1.000

PCS=political and civil system; IND=individualism; PD=power distance; UA=uncertainty avoidance; LGDP=natural log of each nation's gross domestic product; ECGDP=mean stock exchange market capitalization divided by each nation's gross domestic product; TRP=mean stock exchange turnover volume to market capitalization; LS=legal system; LTAS=natural logarithm of average total assets 1996 and 1997; ROA=return on total assets; HILO=perceived industry exposure to the Y2K problem; List Stat=listing status of each firm; and LECOST=natural logarithm of the expected total cost to rectify the Y2K problem in the firm's domestic nation of origin.

& Black, 1995) indicate harmful levels of multicollinearity. As a further test for multicollinearity, variance inflation-factor (VIF) values are calculated with no values exceeding 4.00, substantially below the critical value of 10.00 (Netter, Wasserman, & Kutner, 1989). In a final check of multicollinearity, a series of multiple-regression tests were performed. In the first multiple regression, all but one of the societal variables and control factors (namely, legal system) were included. For subsequent multiple regressions, the excluded variable is reinstated and another is removed. This systematic testing did not indicate any significant changes. Overall, Pearson correlations, VIF values, and systematic multiple-regression tests imply that multicollinearity is not a serious concern.¹⁹

4.2. Multiple-regression analysis

Table 5 presents the multiple-regression results. Overall, the model is highly significant ($P<.001$), explaining 36.5% of the variation in the dependent variable.

¹⁹ This conclusion is consistent with a variety of other studies. Cormier and Magnan (2000) reported pairwise correlations as high as 0.54 but did not consider this as having serious multicollinearity problems for the purposes of their analysis.

Table 5

Effect of societal variables

Multiple regression equation: $TQY2K \text{ Disclosure} = \alpha_1 - \alpha_1 PCS + \alpha_2 IND - \alpha_3 PD - \alpha_4 UA + \alpha_5 MAS + \alpha_6 LGDP + \alpha_7 CIR + \alpha_8 ECGDP + \alpha_9 TRP + \alpha_{10} LS - \beta_1 LTAS + \beta_2 ROA + \beta_3 HILO + \beta_4 List \text{ Stat} + \beta_5 LECOST + \varepsilon$

Variables	Predicted sign	Coefficient	t Statistic	Significance
PCS	Negative	-.625	-2.600	.009*
IND	Positive	3.317E-02	1.469	.142
PD	Negative	-5.910E-02	-2.606	.009*
UA	Negative	-7.185E-04	-.046	.963
MAS	Positive	8.855E-03	-.623	.533
LGDP	Positive	1.898	4.356	.000**
ECGDP	Positive	2.768	4.390	.000**
TRP	Positive	-6.561E-04	-.113	.910
LS	Positive	4.128	5.441	.000**
LTAS	Positive	.562	1.357	.000**
ROA	Positive	1.263E-04	.0108	.914
HILO	Positive	4.634	17.577	.000**
List Stat	Positive	2.191	3.142	.005**
LECOST	Positive	1.589	4.122	.000**
Constant	N/A	3.067	.687	.492
Adjusted $R^2=.365$; F statistic=69.399; Significance=.000**				

PCS (political and civil system): Freedom House (1998) political freedom and civil rights index scores in each nation; IND (individualism): original cultural dimension scores for each nation gathered from Hofstede (1980); PD (power distance): original cultural dimension scores for each nation gathered from Hofstede (1980); UA (uncertainty avoidance): original cultural dimension scores for each nation gathered from Hofstede (1980); MAS (masculinity): original cultural dimension scores for each nation gathered from Hofstede (1980); LGDP (level of economic development): nation's mean GDP in US\$ for the three periods prior to 1997; ECGDP (market capitalization to GDP): mean market capitalization in US\$ divided by the nation's GDP in US\$ for the three periods prior to 1997; TRP (trading volume to market capitalization): mean trading volume as a percentage of the market capitalization for the three year preceding 1997; LS (legal system): dichotomous variable with coded one (1) if firm from nation under a Common Law legal system: coded zero (0) if otherwise; LTAS (firm size): natural log of the average total assets of each firm in US\$ for 1996 and 1997; ROA (economic performance): average return on assets of each firm for 1996 and 1997; HILO (exposure of industry to Y2K): dichotomous variable coded one (1) if a firm is from a highly exposed Y2K industry: coded zero (0) if otherwise; List Stat (listing status): dichotomous variable coded one (1) if a firm is listed on a foreign stock exchange, coded zero (0) if only domestically listed otherwise; LECOST (national materiality of Y2K cost): estimated total cost in US\$ of rectifying the Y2K problem divided by the nation's GDP in US\$ for the three periods prior to 1997. ***= $P<.10$.

* $P<.05$.** $P<.001$.

TQY2K is significantly negatively associated with PCS ($P<.05$) and PD ($P<.05$). In contrast, the coefficients for LGDP ($P<.001$), ECGDP ($P<.001$), and LS ($P<.001$) are all significantly positively associated with TQY2K. Coefficients representing IND, UA, MAS, and TRP are not different from zero. Overall, findings support Hypotheses 1, 3, and 5, but only partial supports Hypotheses 2 and 4. Among the control factors, coefficients for firm size, industry type, listing status, and national materiality Y2K costs are all statistically significant ($P<.01$). The coefficient for economic performance, however, is not statistically significant. Coefficient directional signs of the control factors are as expected.

4.3. Sensitivity analysis

To test the robustness of multiple-regression results and the dependent variable's proxy measure, we conducted additional empirical tests. The proxy measure for dependent variables is reliant, in part, on the coder's subjective judgment, who may introduce potential errors and undue noise into the analysis. To test this possibility, the sample is split into two groups using the sample TY2KD median as the cutoff. Firms with TY2KD values above the median are categorized "High TY2KD" (coded 1) and those below "Low TY2KD" (coded 0). This technique is consistent with prior research (e.g., Cormier & Magnan, 2000). Logistic regression and additional multiple-regression tests are then performed, which yield findings closely matching those reported in Table 5. In another sensitivity test, the multiple-regression tests are performed again, using a deflated TY2KD score (the entire sample's median TY2KD score depresses each firm's actual TY2KD score), rather than the actual TY2KD score for results reported in Table 5. Results using the deflated TY2KD measure show no significant discrepancies with Table 5. A third set of tests, focusing on the dependent variable's proxy measure, involves systematic elimination of outlier observations that may unduly influence results. Regression findings following the elimination of outliers also show no significant disparities with Table 5 results.

Data from Belgium, Indonesia, Italy, South Korea, and Taiwan were originally excluded due to the small representative numbers. As an additional sensitivity test, the model from Table 5 is performed again, but with data from the five previously excluded nations included. The additional test yields no significant differences. Multiple regressions based on the Table 5 model are again performed with alternative common proxy measures for some of the control factors. For firm size, natural logarithm of total revenue is substituted for natural logarithm of total assets, while for economic performance, return on shareholders equity is substituted for return on total assets. All results from these additional tests show no serious alterations in either the significance or directional sign of coefficients for each respective societal variable or control factor than that reported in Table 5. Finally, additional tests are performed to ensure that proxy measures for the independent variables capture each noted dimension rather than being a proxy for country affiliation. For this sensitivity test, a multiple-regression model, including only the control factors and dummy variables for each of the 17 nations represented by the data, is first constructed. A second series of models including control variables and only one societal variable is then formed. R^2 values of regressions performed are then compared. Findings indicate that the explanatory power of each model differed, thereby supporting the view that proxy measures for the societal variables were not substitutes for country affiliation.

5. Conclusions

A primary contribution of this study is that it provides the first large-scale investigation of disclosure practices related to a highly publicized ICT problem

across a wide range of nations with diverse sociopolitical and economic features. In general, the findings suggest that firms around the world are reluctant to voluntarily disclose information on ICT problems, in this case, Y2K, in their annual reports. Additional empirical evidence implies that at an international level there is likely to be asymmetry of information concerns across national boundaries on such issues based on findings related to Y2K. Our findings imply that there are obstacles to fully evaluating and comparing the risks firms face from ICT problems in different nations. A second major contribution is that the study provides empirical evidence of the association between major societal variables and the amount of Y2K disclosure. The results imply that firms are likely to disclose more information on ICT problems, such as Y2K, in (a) less repressive political and civil systems; (b) low power-distance societies; (c) nations with a higher level of economic development; (d) nations where the underlying legal system is based on Common Law; and (e) equity markets with a higher ratio of market capitalization to a nation's GDP.

Various future investigations are possible. One objective of further research could be to consider disclosure practices related to other ICT problems. One area of investigation could address disclosure practices in respect to ICT problems resulting from the conversion to the Euro. With more nations seeking to establish regional ties, various proposals (though rather tentative in nature) have surfaced that call for the use of a common monetary domination (the ASEAN is one such region) in such area. If currency conversions occur more frequently, knowledge of disclosure practices and strategies adopted in respect to the Euro and its impact on ICT could be used to draft policies to ensure that information disclosed is more consistent and comparable. This will enable investors to make better decisions during the period of transition. Another avenue of investigation could be to analyze the possible influence of other societal and firm-level factors such as the education level or level of ICT integration. Being cross-sectional in nature, this study only establishes associations between the societal variables of interest and the amount of disclosure on Y2K. Future studies should seek to establish causal relationships to gather a more rounded understanding of the respective influences on disclosure strategies related to ICT problems. Finally, this study focuses on Y2K disclosure practices for a single period. A longitudinal study will help determine if associations hold over time for other ICT problems.

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Appendix A. Types of ICT problems—their effects and risks, and costs and consequences

(A) Affects and risks of ICT problems		(B) Costs and consequences of ICT problems	
Direct	Indirect	Direct financial and nonfinancial	Indirect financial/nonfinancial
<ul style="list-style-type: none"> ◆ Disruption to the internal and external services and processes provided by the firm's information-technology systems. ◆ Loss of sensitive and general data to the firm. ◆ Injuries, illness, and/or possible death of employees. ◆ Contamination, destruction, and/or deterioration of the firm's work spaces. ◆ Damage, destruction, and/or deterioration of a firm's software and hardware. ◆ Loss of moral, cooperation, and confidence between individual employees, departments, and divisions within a firm. ◆ Delay of non-information-technology-based services offered by the firm (e.g., delivery of merchandise) due to delays in processing of orders, etc., based on information technology. 	<ul style="list-style-type: none"> ◆ Infection of the information systems of suppliers, end-users, and society. ◆ Disruption of services offered by suppliers to their end-users and society. ◆ Disruption to normal patterns of business or life of end-users and society. ◆ Loss of sensitive and general data of suppliers, end-users, and society. ◆ Injuries, illness, and/or death of stakeholders separate from the firm. ◆ Contamination, damage, and/or destruction of the environment (e.g., explosion of a nuclear reactor caused by a computer virus originating via the firm). ◆ Delay and loss of businesses of noninformation technology but stemming directly from the breakdown of information-technology services. 	<ul style="list-style-type: none"> ◆ Purchase of new hardware and software to maintain security. ◆ Purchase of new hardware and software to replace affected systems. ◆ Loss of sensitive data that could jeopardize a firm's competitive advantage. ◆ Lost productivity. ◆ Employment of additional ICT staff. ◆ Legal costs as a result of lawsuits. ◆ Lost revenue during information technology down times. ◆ Additional employee compensation and workplace clean-up costs. ◆ Imposition of fines and other regulatory penalties. ◆ Devolution of management and control. ◆ Additional auditor costs imposed to ensure information presented correctly. 	<ul style="list-style-type: none"> ◆ Repair costs and lost productivity of end-users/suppliers infected via firm's information system. ◆ Damage to firm's reputation and image. ◆ Impact on firm's goodwill. ◆ Costs of the introduction of additional regulatory provisions. ◆ Reduction in a firm's share value. ◆ Disruption to society's stability and decline in social cohesion. ◆ Loss of reputation, image, and goodwill of suppliers and end-users. ◆ Loss of confidence in the firm, suppliers, and end-users. ◆ Loss of society's confidence in information technology, leading to economic downturn; lack of research and development; and negative impact of progress.

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The influence of management perception of environmental variables on the choice of international transfer-pricing methods

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Abstract

In this paper, we provide an empirical study of the association between the management's perception of the importance of environmental variables and their choice of international transfer-pricing methods in the context of a developing economy. Given the sizable investment flowing to developing countries and the amount of economic exchange that occurs through foreign investment in these countries, we believe this is a significant issue. For this study, we collected the data from field interviews with the management of large foreign investment enterprises (FIEs) in China. These FIEs include mainly investors from the United States, Japan, and Europe. Our evidence indicates that the more important management perceives the interests of local partners and the maintenance of a good relationship with host government to be, the more likely that the FIE will use a market-based transfer-pricing method. On the other hand, the more important the management perceives foreign exchange controls in transfer-pricing decisions, the more likely the FIE will choose a cost-based method. Finally, there is a moderate agreement between U.S. and non-U.S. FIEs on the relative importance of the environmental variables.

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Keywords: Environmental variables; Foreign investors; International transfer-pricing; Major developing economy

1. Introduction

In this paper, we empirically investigate how the management's perception of environmental variables influences their choice of international transfer-pricing methods. The study is based on data collected from field interviews with the management of large

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foreign investment enterprises (FIEs), which include Sino-foreign joint ventures and wholly foreign-owned companies in China. As the world economy becomes more globalized, transfer-pricing has become increasingly challenging to multinational corporations (MNCs) in planning and implementing their global operations. Strategically selected transfer prices can maximize global tax savings, minimize operating risks, and circumvent restrictions imposed by host governments. A survey of accounting educators by Sands and Pragasam (1997) found that transfer-pricing was ranked as one of the most important topics in international accounting. However, there are few empirical studies that assess how the management's perceptions of environmental variables influence their selection of transfer-pricing methods in a developing-economy context.

We choose to look at transfer-pricing in China because of China's increasing importance in the world economy and the significant volume of interfirm trade by MNCs with their affiliated companies in China. In the early 1990s, China witnessed a sharp rise in the inflow of direct foreign investment. China's entrance to the World Trade Organization has further accelerated the trend of inflows of foreign investment (*Business Week*, 1999, November 29). Foreign direct investment in China reached US\$50 billion in 2002, and China overtook the United States as the largest recipient of foreign direct investment in 2002 (*SCMP*, 2003, February 15). China's foreign trade has also grown substantially in the past decade, and China has been ranked as a top 10 trading nation in the world since 1999 (United Nations, 2002). FIEs play an increasingly important role in China's foreign trade. For example, total imports and exports by FIEs accounted for, respectively, 54% and 52% of the country's total imports and exports in 2002 (52% and 50%, respectively, in 2001; MOC, 2003; SSB, 2002). As will be explained later, these trades include a large volume of transactions with their overseas affiliated companies. Although China is unique, due to its rapid economic growth rate and large population, it is essentially a developing country and is classified as such by the International Monetary Fund (2003). The findings of this study, therefore, should serve as a useful reference for other developing economies by enhancing their understanding of MNCs' transfer-pricing behaviors.

Prior studies on the important environmental variables that MNCs use to make their transfer-pricing decisions have focused on developed countries. This study extends prior studies by examining how the management's perception of the relative importance of environmental variables affects their choice of transfer-pricing methods in China, which is a developing economy. Seven environmental variables important to operations in developing countries are examined in the context of the business environment in China. These variables are (1) difference in income tax rates, (2) minimization of custom duties, (3) the interests of local partners, (4) foreign exchange control and risks, (5) restrictions of profit repatriation, (6) risks of expropriation and nationalization, and (7) a good relationship with the host government.

The analysis of our data reveals that management's perception of three environmental variables, namely, the interests of local partners, foreign exchange control, and the maintenance of a good relationship with the host government, are significant to discriminate FIEs' choice of transfer-pricing methods. The more important the management perceives the interests of local partners and the maintenance of a good relationship with the host government to be, the more likely that an FIE will use a market-based method. The more important the management perceives foreign exchange controls to be, the more likely

a cost-based method will be used. Overall, there is a moderate agreement between U.S. and non-U.S. FIEs on the relative importance of the environmental variables studied.

The next section describes the research design and methodology. The results of the field study and of the statistical testing of hypotheses will then be presented. The final section concludes the paper.

2. Research design and methodology

2.1. Business environment and international transfer-pricing

Leitch and Barrett (1992) survey the literature showing that MNCs emerge to exploit market imperfections arising from a set of economic and sociopolitical factors that vary from country to country. Transfer pricing is regarded as a mechanism available for MNCs to maximize profits by exploiting these market imperfections. Prior studies examined the relative importance of environmental variables that constitute market imperfections to the choice of transfer-pricing methods. Most of these studies surveyed MNCs operating in the United States (Borkowski, 1992, 1997a, 1997b; Burns, 1980; Tang, 1979, 1993; Yunker, 1983). A few studies surveyed MNCs in other developed countries including Japan (Borkowski, 1997a; Tang, 1979; Tang & Chan, 1979), Britain (Finnie, 1978; Mostafa, Sharp, Howard, 1984; Tang, 1981), and Canada (Borkowski, 1997b; Tang, 1981). Some of these studies generated rankings that reflect the relative importance of environmental variables (Tang, 1981; Tang & Chan, 1979). It is, however, difficult to generalize these findings to MNCs operating in developing countries, as the business environment of developing countries is quite different from that of developed countries. For example, more restrictive rules on the movement of capital and the higher financial and political risks of operations are typically expected in developing countries.

Extant empirical studies on transfer-pricing decisions in developing countries are relatively limited. Chan and Chow (1997a) examined the transfer-pricing issue in China from the perspective of tax authorities. They analyzed the characteristics of FIEs being audited for transfer pricing, the reasons for initiating these tax audits, and the methods adopted by tax authorities for adjusting FIE profits. Chan and Chow (1997b) provided evidence of transfer-pricing manipulation in selected industries in China using import and export data. Chan and Chow (2001) investigated the impact of form and source of investment, activity orientation, and production technology on transfer-pricing policy. Kim and Miller (1979) surveyed U.S. MNCs having operations in developing countries, and ranked the relative importance of nine variables affecting their transfer-pricing decisions. Their study revealed a great similarity in the ranking of these variables across developing countries. They argued that many variables inherent in developing countries, such as foreign exchange controls and restrictions on repatriation of profits, play a significant role in the transfer-pricing strategy of MNCs operating in developing countries.

Like most developing countries, China offers preferential policies to attract foreign investment. At the same time it imposes controls on outflow of capital. As analyzed by Chan and Chow (1997b), the business environment in China gives rise to a mixed inducement on MNCs' transfer-pricing decisions. Table 1 summarizes the aspects of the

Table 1

Aspects of business environment in China that are of special relevance to international transfer pricing

Environmental variables	Analysis
Corporate income tax	Normal income tax rate of 30%, reduced tax rates of 15% and 24% for FIEs located at designated economic zones and open cities. Tax incentives include exemption from taxation for the first two profit-making years and a 50% tax reduction for the following 3 years for qualified investors.
Custom duties	Import tariffs (a simple average of import tariff rates of 22%, 16%, 15%, and 12% respectively for 1999, 2000, 2001, and 2002) higher than in developed countries. Duty exemption for imports used for export production.
Foreign exchange control and risks	Centralized foreign exchange control; The local currency, <i>Renminbi</i> , not fully convertible; Consistent devaluation of <i>Renminbi</i> in the 1980s and early 1990s. Strict requirement of balancing foreign exchange expenditure and revenue for FIEs. Central control over FIEs' foreign exchange transactions through monthly reports submitted by banks to the government agencies of foreign exchange control.
Form of foreign investment	Major forms of foreign investment include joint ventures and wholly foreign-owned enterprises. Most joint ventures are equity joint ventures. Profits in equity joint ventures are distributed in proportion to the partners' equity stakes.
Restrictions on remittances	No local partner in case of wholly foreign-owned enterprises. No restriction on the repatriation of dividends, royalties, and interest by FIEs, subject to availability of foreign exchange. Withholding tax on interest and royalties of 20% or at a preferential rate specified in tax treaties; Allocation of management fees incurred by the parent companies not allowed. Withholding tax on interest and royalties are allowed as credits against home country's corporate income taxes.
Political pressure	Bilateral investment treaties with more than 40 countries; Government reassures minimal risk of expropriation.

Adapted from Andersen (2001), Chan and Chow (1997b), and *China Daily* (2002, Dec. 23).

business environment in China that are considered to affect FIEs' transfer-pricing decisions. Given a particular set of environmental characteristics, management is faced with the task of achieving a set of objectives through transfer pricing, including maximizing corporate profits, minimizing financial risks, and taking care of other behavioral and political aspirations. Achieving these goals within organizational and environmental constraints entails tradeoffs among objectives. While it is difficult to examine the management's decisions about these tradeoffs, directly, they are reflected by the management's perception of the relative importance of environmental variables in their choice of transfer-pricing methods.

Empirical studies reveal that MNCs rarely adopt transfer-pricing methods developed by economic models such as the marginal cost and opportunity cost models, because they are not comprehensive enough to model the global environment of MNCs (Tang, 1979, 1981, 1993; Wu & Sharp, 1979; Yunker, 1983). Market-based methods and methods based on

accounting costs are most commonly used. Market-based methods use comparable market prices or adjusted market prices, which reflect the economy of internal transfers. Advocates of these methods argue that market prices are less manipulative and could minimize the disputes between managers of affiliates (Anthony & Dearden, 1980; Cook, 1995; Granick, 1975). They are also perceived to be more objective and fair, and are less likely to be challenged by tax authorities (Al-Eryani, 1987). Cost-based methods include actual full cost, standard full cost, actual variable cost, and standard variable cost. Mark-up may or may not be added to costs. If the company's policy is to tie the mark-up to prevailing market price, the transfer-pricing method will be classified as a market-based method. If the policy is to determine mark-up based on a desired rate of return on investment or capital, the transfer-pricing method will be classified as a cost-based method. Cost-based methods are basically internally determined using internal cost data available. However, the literature acknowledges arbitrariness in cost allocation and the difficulties in determining a fair profit to add to cost (MaAulay & Tomkins, 1992; Merville & Petty, 1978; Thomas, 1971). Because of this arbitrariness, these methods provide more room for MNCs to pursue their corporate objectives in maximizing after-tax profits and minimizing operational risks.

China's transfer-pricing regulations (State Council, 1991) allow the use of the comparable uncontrolled-price method, the resale-price method, cost-plus method, and other reasonable methods, which may include cost-based methods acceptable to Chinese tax authorities. In practice, comparable market prices may not exist for many products because transactions that appear similar are often economically different in terms of underlying facts and circumstances (Picciotto, 1992). Therefore, both cost-based and market-based pricings are used in practice.

Specific hypotheses for the impacts of management's perception of the importance of the seven environmental variables on the choice of the two transfer-pricing bases are elaborated below. While the first two variables are generally relevant to all countries, the other five variables are of special relevance to developing countries.

2.2. Hypotheses

2.2.1. Difference in corporate income tax rates

Difference in income tax rates among different jurisdictions is one of the most often quoted variables in the literature, which provides MNCs with opportunities to use transfer pricing to minimize global tax payments. The greater the difference in income tax rates between two countries, the greater is the incentive for MNCs to use transfer pricing to shift income.

The income tax rate applicable to FIEs operating in China is 30%. The government offers certain tax incentives for qualified foreign investors. A preferential income tax rate of 15% is granted to FIEs located in special economic zones and in economic and technological development zones. A preferential rate of 24% is offered to industrial FIEs located in open economic zones and cities. For FIEs of a production nature scheduled to operate for a period not less than 10 years, an exemption from taxation for the first two profit-making years and a 50% tax reduction for the following 3 years are granted. However, currently, many FIEs are either beyond their tax holiday period or not qualified for such holidays.

Although tax minimization has been cited as one of the transfer-pricing objectives, some argue that the tax variable should not be overrated in transfer-pricing policies in developing countries because of the existence of other nontax influences in these countries (Kim & Miller, 1979; Plasschaert, 1985). However, in general, tax consideration remains an important issue in transfer-pricing decisions. The more important the management perceives this income tax variable, the greater the motivation that management will use transfer-pricing to reduce global tax payments, and the more likely management will adopt cost-based transfer-pricing methods that facilitate the pursuit of this corporate objective.

Hypothesis 1. The more important the difference in corporate income tax rates is perceived by management of FIE, the more likely that a cost-based transfer-pricing method will be adopted.

2.2.2. Minimization of custom duties

Minimization of import duties is an incentive for MNCs to underprice goods transferred into a country. Underpricing of imports can also circumvent restrictions such as a value quota on imports imposed by host government. The Chinese government adopts a tariff-escalation policy, whereby nominal tariffs vary with the degree of domestic processing. Tariffs are lower for raw materials and semiprocessed materials than for final goods. Import duties in China are, in general, substantially higher than those in developed countries, although these duties face a downward trend as China enters the World Trade Organization. There is a *prima facie* inference that the relatively high *ad valorem* tariffs in most developing countries are likely to tempt MNCs to use transfer-pricing to minimize tariff payments (Plasschaert, 1985). However, underpricing of imports from related companies to minimize tariff payments will result in higher reported profits by FIEs, and this is not compatible with the considerations of restrictions on profit repatriation and foreign exchange control, as discussed later. The impact of custom duties on FIEs' transfer-pricing decision thus depends on the relative importance of this variable as perceived by management. The more important the tariffs are perceived by management, the more likely that the management will adopt cost-based transfer-pricing methods to facilitate the minimization of tariff payments.

Hypothesis 2. The more important minimization of custom duties is perceived by FIE management, the more likely that a cost-based transfer-pricing method will be used.

2.2.3. The interests of local partners

Like other developing countries, the Chinese government prefers foreign investors to operate in China, in the form of a joint venture with a local partner. The existence of a local partner in a joint venture reduces the share of reported profits attributable to foreign investors and, hence, provides an inducement for the foreign investors to use transfer pricing to shift profits outward (Emmanuel & Mehafdi, 1994). As more profits are shifted away from China, the local partner's share of profit will be reduced. To safeguard their legitimate interests, the local partners may actively get involved in transfer-pricing decisions. Thus, a local partner may play a monitoring role, which restricts the latitude

of transfer-pricing strategies practiced by foreign investors (Lall, 1973; Emmanuel & Mehafdi, 1994).

Parties to some joint ventures in China may enter into a management contract, whereby full management responsibility is delegated to the foreign partners who control the production and financial functions of business operations. In other cases, local partners may participate actively in the business decisions. We hypothesize that the impact of a local partner on the transfer-pricing decisions depends on the management role of local partners and the importance of the interests of local partners as perceived by the corporate management. The more corporate management recognizes the importance of the interests of a local partner, the more likely that management will attempt to minimize conflicts between partners over transfer-pricing by adopting a method that is relatively objective and fair to both parties and with less room for manipulation. This leads to a greater likelihood of adopting a market-based transfer-pricing method.

Hypothesis 3. The more important the interests of local partners is perceived by corporate management, the more likely that a market-based transfer-pricing method will be adopted.

2.2.4. *Foreign exchange control and risks*

Foreign exchange control imposed by developing countries is regarded as a strong inducement for MNCs to shift profits out of these countries. Transfer pricing may assist in managing foreign exchange risks by reducing liquid assets of subsidiaries in countries where a foreign exchange control is imposed.

Until the early 1990s, China had a centrally managed foreign exchange control system. Access to foreign exchange was limited. FIEs were allowed to retain foreign exchange earnings and made payments of foreign exchange therefrom. These enterprises were required to balance their foreign exchange revenue and expenditure, and were required to file their annual budget of foreign exchange expenditure with the government. Since 1994, the government has gradually relaxed its foreign exchange control policy. A system of limited convertibility of the local currency, *Renminbi*, was introduced. In 1996, *Renminbi* became freely convertible for current account items including payments for trading, transportation, and tourism activities. However, capital account transactions, including capital investment, are still subject to foreign exchange control.

The limited convertibility of *Renminbi* and the restrictions on access to foreign exchange are likely to increase the financial risks for business operation in China. Shortage of foreign currency has been cited as one of the most serious problems facing FIEs, especially those aiming at the domestic market or those relying heavily on the import of raw materials and machinery (Davis & Yi, 1992; Frisbie, 1988). The significance of the impact of foreign currency exchange controls on an FIE depends on the nature of its business operations. We hypothesize that the greater the importance of the foreign currency exchange control is perceived by management, the greater the inducement for the management to use transfer pricing to circumvent such a control and to reduce the associated risks. This is expected to increase the likelihood that management will adopt a cost-based transfer-pricing method that provides management more flexibility in pursuing this objective.

Hypothesis 4. The more important the foreign exchange control and risk is perceived by management, the more likely that a cost-based transfer-pricing method will be adopted.

2.2.5. Restrictions on profit repatriation

Restrictions on profit remittances, including dividends, royalties, and management fees, or high withholding tax on such remittances imposed by host countries, provide an inducement for MNCs to shift funds through transfer-pricing. As these restrictions are more likely to be imposed by government in developing countries, relative to developed countries, this variable is considered important to transfer-pricing decisions in developing countries (Kim & Miller, 1979; Plasschaert, 1985).

While the Chinese government does not ban foreign investors from repatriating their legitimate share of profits or royalties, these remittances are subject to the availability of sufficient foreign exchange funds that an FIE has for this purpose. Withholding taxes on payment of interest, rentals, and royalties to affiliated companies are levied at a general rate of 20%, or at a preferential rate as specified in tax treaties. According to tax treaties entered into by the Chinese government with other countries, these taxes are allowed as credits against a home country's corporate income tax. However, the Chinese tax law disallows the repatriation of management fees to parent companies, except for those incurred for specific and direct services provided by the parent companies, such as training the local employees of the FIEs. The impacts of these regulations on transfer-pricing decisions depend upon the management perception of their importance. The more important the restrictions on profit remittances are perceived by management, the greater the motivation of management to circumvent these restrictions, and the more likely that cost-based transfer-pricing methods will be used as a mechanism to pursue this objective.

Hypothesis 5. The more important the management perceives the restrictions on profit repatriation, the more likely that a cost-based transfer-pricing method will be used.

2.2.6. Risks of expropriation and nationalization

The perceived political risks relating to foreign operations, including expropriation and nationalization, have been concerns to MNCs operating in developing countries. A high risk perceived by an MNC may direct it to seek an early return on its investment through the transfer-pricing mechanism. Political risk has been a major concern to foreign investors in a socialist country. To alleviate foreign investors' concern, the Chinese government has enacted laws to protect their legal rights and interests. The government also signed bilateral investment treaties with more than 40 countries, including the United Kingdom, Japan, Australia, Germany, and France, which guarantee either no expropriation or compensation in the event of expropriation. It, however, has not been able to conclude an investment treaty with the United States. While the possibility of expropriation of foreign-invested enterprises is small, the risk cannot be ruled out. For example, to construct the famous Oriental Plaza in Beijing, McDonald's was pushed off the site, although it had a 20-year lease there. The government retains the right to nationalize or expropriate enterprises under special circumstances. The more important the management perceives this risk, the greater disposition that management will use transfer pricing to minimize it by diverting liquid funds outward, and the more likely that cost-based transfer-pricing methods will be used.

Hypothesis 6. The more important the management perceives the risks of expropriation and nationalization, the more likely that a cost-based transfer-pricing method will be used.

2.2.7. Good relationship with host government

Empirical studies reveal that MNCs value maintaining good relations with host governments in formulating their transfer-pricing policies (Tang, 1979, 1981; Yunker, 1983). Al-Eryani (1987) found that this variable is more important for MNCs operating in developing countries than for their counterparts operating in developed countries. In China, a good relationship with government agencies is helpful to smooth business operations and to negotiate bureaucratic hurdles. This is, in part, cultural and, in part, due to the relatively low transparency of the legal system in China (Chan & Jiang, 2002). To maintain a good relationship with the government, FIEs endeavor to avoid any disputes or conflicts with the tax authorities and the government departments. Thus, we hypothesize that FIEs will more likely use market-based methods, which are perceived to be more objective than cost-based methods, in formulating their transfer-pricing policies to avoid such disputes and conflicts.

Hypothesis 7. The more important the management perceives the maintenance of a good relationship with the Chinese government, the more likely that an FIE will use market-based transfer-pricing methods.

A summary of these hypotheses is in Table 2.

2.3. Data collection

We conducted a series of interviews to collect data for this study in 2000. The interview questionnaire consists of three sections. Section 1 deals with the transfer-

Table 2
Summary of hypotheses

Hypothesis	Environmental variables	Choice of transfer-pricing methods
1	Difference in income tax rates	The more important this variable is perceived by management, the more likely a cost-based method will be used.
2	Minimization of custom duties	The more important this variable is perceived by management, the more likely a cost-based method will be used.
3	Interests of local partners	The more important this variable is perceived by management, the more likely a market-based method will be used.
4	Foreign exchange control and risks	The more important this variable is perceived by management, the more likely a cost-based method will be used.
5	Restrictions on profit repatriation	The more important this variable is perceived by management, the more likely a cost-based method will be used.
6	Risks of expropriation and nationalization	The more important this variable is perceived by management, the more likely a cost-based method will be used.
7	Good relationship with the Chinese government	The more important this variable is perceived by management, the more likely a market-based method will be used.

pricing policies adopted by the sample firms (FIEs). Interviewees were asked to elaborate on their dominant transfer-pricing method (in terms of dollar value transferred) for trading with their overseas affiliates, and on the transfer-pricing decision-making process. Section 2 contains demographic information about the FIEs, including source and percentage of foreign investment, size of firm, volume of trade with overseas affiliated companies, and income tax rates applicable to the company. Section 3 consists of questions on the importance of the seven environmental variables when formulating transfer-pricing policies. Interviewees were asked to assess the importance these variables played in formulating their transfer-pricing policies according to a five-point scale (1—Extremely important, 2—Very important, 3—Moderately important, 4—Not too important, and 5—Not important at all).

The interviews were conducted in major cities in China, including Beijing, Shanghai, Guangzhou, Xiamen, Shenzhen, and the open cities of Pearl River Delta. The sample FIEs for the interviews were selected from a directory of the top (largest 500) industrial FIEs in China, as designated by the Chinese government in terms of annual sales. FIEs in these cities that trade goods or materials with their overseas affiliated companies were contacted for interview. Our sample comes from 64 FIEs that provided information for this study.

When arranging the interviews, the local contacts informed the interviewees about the nature of our interviews and were assured of the interviewees' familiarity with the transfer-pricing process in their firm before arranging the interviews. Behavioral research confirms that an ongoing personal relationship with an interviewee promotes truthful responses (Bazerman, Loewenstein, & Moore, 2002). We chose to interview the financial controllers of these FIEs who actively participated in the transfer-pricing decisions because of their expertise. With their first-hand knowledge of and experience in the operating environments in China, they were particularly able to articulate the importance of the hypothesized environmental variables and their tradeoffs in achieving the transfer-pricing objectives. In some cases, interviewees brought their assistants to the interview to make sure that they could answer our questions comprehensively. All the interviewees were either expatriates who have come from an overseas head office and who had extensive experience in China, or local persons who received training from the head office. They were informed of the transfer-pricing process in their own firms. At the beginning of the interviews, we explained the objective of the study and assured the confidentiality of the information they provide. We also explained the various transfer-pricing methods to assure consistent understandings of the terms and proper codification of the methods adopted by these FIEs. When explaining the terms and asking the questions, we were careful not to reveal any opinion, which might influence the interviewees' response. We also looked for any inconsistencies in the interviewees' responses. After the interview, we searched the business directories to verify the demographic information provided by the interviewees. We also conducted interviews with four partners in two large CPA firms in Hong Kong and discussed with several CPA firm partners in China to confirm the reasonableness and logic of the data we collected. As we knew the identity of the interviewees, we were able to contact them for follow-up clarifications of our interview notes. These control measures, taken together, provide reasonable assurance that the data collected are valid and reliable.

3. Analysis of data

3.1. Profile of the sample firms

The 64 sample firms are engaged in a variety of manufacturing activities including chemicals, electronics, electrical appliances, pharmaceutical, and medical equipment. The sources of foreign investment of these FIEs are mainly from the United States, Japan, Hong Kong, Taiwan, and European countries, including the United Kingdom, Germany, Belgium, Netherlands, Switzerland, Norway, and France. About 30% of the sample firms are from the upper part of the top 500 companies in terms of sales. The annual sales range from US\$60 million to more than US\$3000 million. Foreign investors in all sample firms hold at least 25% of equity share, including 11 wholly foreign-owned companies. On average, foreign investors hold 63% of the equity shares of an FIE. Most of these FIEs have a great volume of transactions with their overseas affiliated companies. In 51 FIEs (80% of the sample firms), interaffiliate trade accounts for more than 75% of their total trade.

3.2. Transfer-pricing policies

Thirty-eight FIEs (59% of the sample) adopted market-based transfer-pricing methods, and most of them used adjusted market prices. Adjusted market prices are the comparable market prices adjusted by an amount reflecting the economic difference between open market sales and internal transfers, for example, the marketing expenses saved. Usually, the adjustment can be easily determined and documented. Of the 26 FIEs (41% of the sample) that adopted cost-based methods, more than half of them used standard full cost plus markups (Table 3A). Methods including marginal cost, opportunity cost, mathematical programming, and profit-splits were not used. A great majority of the sample firms (75%) have the autonomy to purchase raw materials and components from unrelated companies (Table 3B). FIEs with more autonomy will have larger power when setting transfer prices with their affiliates. In 41 FIEs (64% of the sample), parent companies of foreign partners were consulted before determining transfer-pricing policies, and more than half of these were FIEs where the majority shareholdings were by foreign investors (Table 3C). Fourteen FIEs (22% of the sample) determined their transfer-pricing policies without direct influence from parent companies. Nine FIEs (14% of the sample), all U.S. MNCs, adopted parent company's worldwide transfer-pricing policies. Only 16% of sample firms have had disputes with affiliates over transfer prices during the past 2 years (Table 3D). Several approaches were adopted to resolve these disputes, including negotiation between FIEs and related companies, negotiation with interference from the parent companies, or negotiation with interference from the tax authorities.

3.3. Importance of environmental variables as perceived by management

Table 4 shows the mean scores of the importance of the seven hypothesized environmental variables as perceived by the management of the sample firms (range is

Table 3

Transfer pricing policies

(A) Transfer-pricing Methods

	Market-based methods		Cost-based methods		
	Market prices	Adjusted market prices	Actual full cost plus	Standard full cost plus	Standard variable cost plus
No. of FIEs	10	28	9	16	1
Total FIEs (%)	16	44	14	25	1

(B) Autonomy in external sourcing of materials or components

	Having autonomy	Not having autonomy
Number of FIE	48	16
Total FIEs (%)	75	25

(C) Transfer-pricing decisions and foreign equity share

Transfer-pricing decisions	Foreign equity share		
	Over 50%	Not exceeding 50%	Total (%)
Decided by FIEs with consultation of foreign partner's parent company	26	15	41 (64)
Decided by FIEs without direct influence from foreign partner's parent company	8	6	14 (22)
Adopted the worldwide policies of the foreign partner's parent company	9	0	9 (14)
	43	21	64 (100)

(D) Disputes over transfer prices

	Having disputes	Not having disputes
Number of FIEs	10	54
Total FIEs (%)	16	84

from 1 to 5, with 1 being most important). For all sample firms, maintaining a good relationship with the Chinese government and the difference in income tax rates are perceived as the two most important variables. Risk of expropriation and nationalization by host countries is perceived as least influential in the choice of transfer-pricing methods. A comparison is made between U.S. FIEs and non-U.S. FIEs in our sample to see whether these firms take the same environmental factors into account when choosing their transfer-pricing methods, as revealed by Arpan (1972). The Mann–Whitney tests do not reveal significant differences in the importance of these variables as perceived by U.S. and non-U.S. FIEs. The Kendaltau test of the rank-order of the importance of these variables (correlation coefficient=.586; $P=.068$) shows that there is moderate agreement between these two groups on the relative importance of the variables.

Finally, a check of the correlations coefficients among the environmental variables shows that only differences in income tax rates (Var_1) and minimization of custom duties (Var_2) have a moderate correlation of slightly larger than .50. As will be explained later,

Table 4

The perceived importance of environmental variables affecting international transfer pricing

Variables	All sample FIEs		U.S. FIEs in sample		Non-U.S. FIEs in sample	
	Mean	Ranking	Mean	Ranking	Mean	Ranking
1 Difference in income tax rates	2.70	2	2.91	3	2.59	1
2 Minimization of custom duties	3.03	5	3.09	4/5	3.00	4
3 Interests of local partners	2.98	3	3.09	4/5	2.93	3
4 Foreign exchange control and risks	3.02	4	2.68	2	3.19	5
5 Restrictions on profit repatriation	3.75	6	3.55	6	3.86	6
6 Risks of expropriation and nationalization	4.31	7	4.32	7	4.30	7
7 Good relationship with the Chinese government	2.64	1	2.59	1	2.67	2

The importance of variables is measured by a five-point scale as follows: 1—extremely important; 2—very important; 3—moderately important; 4—not so important; 5—not important at all.

our multicollinearity and sensitivity tests show that this correlation has no impact on our analysis.

3.4. Statistical testing of research hypotheses

Table 5 shows the mean scores of the importance of the seven hypothesized environmental variables, as perceived by FIEs using market-based transfer-pricing methods and those using cost-based transfer-pricing methods. The statistical tests of these mean scores

Table 5

The perceived importance of environmental variables perceived by sample firms using different transfer-pricing methods

Environmental variables		FIEs using market-based methods	FIEs using cost-based methods	Test of significance of difference in mean scores
		Mean score	Mean score	Mann–Whitney <i>U</i> (<i>Z</i> value)
Var ₁	Difference in income tax rates	2.66	2.77	0.11
Var ₂	Minimization of custom duties	2.89	3.23	0.98
Var ₃	Interests of local partners	2.45	3.77	3.34**
Var ₄	Foreign exchange control and risks	3.39	2.46	2.53**
Var ₅	Restrictions on profit repatriation	3.71	3.80	0.55
Var ₆	Risks of expropriation and nationalization	4.39	4.19	0.43
Var ₇	Good relationship with the Chinese government	2.39	3.00	1.68*

The importance of variables is measured by a five-point scale as follows: 1—extremely important; 2—very important; 3—moderately important; 4—not so important; 5—not important at all.

* Significant at 5% level.

** Significant at 10% level.

reveal significant differences in the perceived importance of three variables between FIEs using different transfer-pricing methods. These three variables are the interests of local partners, foreign exchange control and risks (both significant at the 5% level), and a good relationship with the Chinese government (significant at the 10% level). FIEs using market-based transfer-pricing methods perceived the interests of local partners and a good relationship with the Chinese government as more important, while FIEs using cost-based transfer-pricing methods perceived the foreign exchange control as more important. Unlike prior studies, the variable, risks of expropriation and nationalization, is not perceived as important for FIEs using either the cost-based or market-based transfer-pricing method. This suggests that the Chinese government has successfully eased foreign investors' concerns about the political risks associated with doing business in China, which should help open up the economy and attract foreign investment.

To investigate further the significance of management perception of the importance of these variables to the choice of transfer-pricing methods in a multivariate setting, a logistic regression analysis is performed (Balakrishnan & Soderstrom, 2000; Menon & Williams, 1991; Norusis, 1999; Simons, 1987). The logistic regression function is as follows:

$$TP = \alpha_0 + \sum_i \alpha_i \text{Var}_i, \quad (1)$$

where:

TP = binary variable assuming the value of 0 if cost-based methods are used, and 1 if market-based methods are used;

Var_{*i*} = the importance of variable *i*, where *i* = 1, 2, ..., 7, measured by a five-point scale, with 1 being extremely important and 5 being not important at all. These variables are:

- Var₁: Difference in income tax rates
- Var₂: Minimization of custom duties
- Var₃: Interests of local partners
- Var₄: Foreign exchange control and risks
- Var₅: Restrictions on profit repatriation
- Var₆: Risks of expropriation and nationalization
- Var₇: Good relationship with the Chinese government.

α_{*i*} values are the regression coefficients.

Because the dependent variable is dichotomous, we use logistic regression analysis (Norusis, 1999). The results show how the trade-off among the environmental variables affects the choice of transfer-pricing methods. The results of the regression analysis are shown in Table 6. Variance inflation factors are all less than two, indicating that multicollinearity is unlikely to affect our inferences. White's heteroskedasticity test suggests that the homogeneous-variance assumption was not rejected at the .05 level.

The analysis confirmed that Var₃ and Var₄, (the interests of local partners and foreign exchange control and risks) are significant at 1% level and that Var₇, that is, good relationship with the Chinese government, is significant at the 5% level in discriminating FIEs' choice of transfer-pricing methods. The model is significant at the 1% level. Indicating a good fit for the model, 87% of FIEs using market-based methods and 65% of

Table 6

Logistic regression analysis of management perception of the importance of environmental variables to the choice of transfer-pricing methods

Independent variables in logistic regression function	Predicted sign	Logistic regression analysis		
		Coefficient	Chi-square	P value
Model			28.063	.001***
Var ₁ : Difference in income tax rates	+	.276	0.816	.366
Var ₂ : Minimization of custom duties	+	-.175	0.268	.605
Var ₃ : Interests of local partners	—	-.860	7.102	.008***
Var ₄ : Foreign exchange control and risks	+	.871	7.915	.005***
Var ₅ : Restrictions on profit repatriation	+	.024	0.007	.935
Var ₆ : Risks of expropriation and nationalization	+	-.044	0.018	.892
Var ₇ : Good relationship with the Chinese government	—	-.675	4.216	.040**

The logistic regression function is as follows:

$$Z = b_0 + \sum b_i \text{Var}_i$$

where: Z is the model score of logistic distribution (0=cost-based, 1=market-based), b_i is the model coefficient for the independent variables (i.e., the seven environmental variables).

Based on the logit function, 65.38% of FIEs using cost-based methods and 86.84% of FIEs using market-based methods are correctly classified.

** Significant at 1% level.

*** Significant at 5% level.

FIEs using cost-based methods are correctly classified. The signs of the coefficient for these three variables are consistent with the hypotheses. FIEs that regard the interests of local partners and a good relationship with the Chinese government as being important are more likely to use market-based methods, and FIEs that perceive the foreign exchange control and risks as being important are more likely to use cost-based methods. These results are consistent with our univariate analysis. We do not find significant discriminating power in Var₁, Var₂, Var₅, and Var₆, that is, difference in income tax rates, minimization of custom duties, restrictions on profit repatriation, and risks of expropriation and nationalization. In other words, FIEs using cost-based methods and FIEs using market-based methods perceive similar degree of importance for each of these variables. The increasingly effective tax audits in China may reduce the FIEs' incentive to use cost-based methods to manipulate these variables. However, foreign exchange control remains the most important variable for FIEs using cost-based methods (Table 5).

We conducted additional tests to check the robustness of the regression results. First, we added a dummy variable in the regression model signifying a majority or a minority foreign investor. Second, we added a variable representing the percentage of foreign ownership. Third, we added a dummy variable representing having consultation or no consultation with the foreign head office in setting transfer prices. Fourth, we excluded from the sample those FIEs that adopted the parent's worldwide transfer-pricing policies. Fifth, we included a dummy variable representing U.S. versus non-U.S. foreign investors. Sixth, we included the size of the FIE (in terms of the logarithm

of sales) in the model. Seventh, we added a variable representing the FIE's exports as a percentage of total sales. Eighth, we included the FIE's proportion of interaffiliate trade as a percentage of total trade in the model.

The results of the eight sensitivity tests show that the interests of local partners (Var_3), foreign exchange controls (Var_4), and good relationship with the Chinese government (Var_5), which were significant in the original model, remain significant at the .01 to .05 level in all tests. The only exception is that the interests of local partners (Var_3) lost its significance in the second test due to a high correlation between this variable and the percentage of foreign ownership in an FIE. The interests of local partners become less important as the percentage of foreign ownership increases. None of the newly added variables in the above tests was significant at the .05 level.

Finally, we deleted minimization of custom duties (Var_2) in the model to assess the effect of its moderate correlation with the income-tax variable (Var_1). The results of the reduced model are the same as the original model.

4. Conclusion

Despite expressed concerns about the significance of transfer-pricing to the economy of developing countries, there is limited empirical research that addresses the influences of environmental characteristics in these countries on MNCs' choice of transfer-pricing methods. The MNCs' operations in developing countries are subject to more economic, political, and social risks due to the peculiar business environment in these countries. These factors provide inducements for MNCs to use transfer pricing to maximize after-tax profits, to circumvent government restrictions, and to reduce financial risks.

This study provides empirical evidence on how environmental variables influence an MNCs' transfer-pricing decisions in the context of the business environment in China, a major developing economy. The analysis reveals that management's perception of nontax forces, namely, interests of local partners, foreign exchange control and risks, and a good relationship with the local government, are important in discriminating the choice of transfer-pricing methods. The greater the importance of the interests of local partners as perceived by management, the more likely that market-based transfer-pricing methods will be used. These methods are considered more objective and fairer to both parties of joint ventures as compared with cost-based methods. This finding is, in general, consistent with the previous studies that hold the view that a local partner in a joint venture plays a monitoring role that restricts the latitude of the transfer-pricing strategy practiced by foreign investors. This study also reveals that the greater the importance of foreign exchange control and risks as perceived by management, the more likely that cost-based transfer-pricing methods will be used, as cost-based methods allow more flexibility for dealing with restrictive laws or regulations. In addition, the more important a good relationship with the local government as perceived by management, the more likely that market-based transfer-pricing methods will be adopted to minimize disputes with government and tax authorities. Certain variables, such as restrictions on profit repatriation and risks of expropriation and nationalization, were not found to be important because it appears that these problems have largely been solved by the Chinese government's open-

door policy. Other variables, such as income tax and custom duties, which are of general relevance to all countries, were not found to be significant in discriminating the choice of transfer-pricing methods in China.

A limitation of this study is that the data are based on a convenience sample of FIEs rather than a random sample, as FIEs in China would not normally grant interviews on sensitive issues like transfer-pricing without prior personal contacts.

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Book Review Section

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Book reviews

Applying International Accounting Standards

David Cairns with Brian Creighton and Anne Daniels, Tolley LexisNexis, 3rd ed., 2002, xxxi+1178 pp.

David Cairns is one of the most active writers in the field of the International Financial Reporting Standards (IFRS), formerly known as the International Accounting Standards (IAS). The IFRS/IAS are published by the International Accounting Standards Board (IASB), the successor to the International Accounting Standards Committee (IASC). As secretary general of the IASC from 1985 to 1994, Cairns was at the root of many current developments. The third edition of his most outstanding work, *Applying International Accounting Standards*, is the subject of this review. Note that the title of the publication has not yet been adapted to the change in name from IAS to IFRS. Brian Creighton and Anne Daniels of BDO Stoy Hayward did much of the revision work on this new addition. The book runs 1178 pages and includes an extensive index. It is intended to be useful for analysts, academics, students of accounting, and practitioners.

What are the powerful points that make this publication successful? In other words, why use this publication and not just the original IFRS Bound Volume?

First of all, the book is comprehensive and discusses all the important elements of all IFRS, including the historical context of the relevant standards and chapters on the history of IASC/IASB, the use of IFRS, and some general characteristics of most standards.

A second strong feature is that the book is organized along topical lines, not along the lines of specific IFRS and interpretations. For example, Chapter 10, Income statement, discusses the elements of IAS 1 on the presentation of financial statements; IAS 8 on profit and loss, fundamental errors, and changes in accounting policies; and Interpretation (SIC) 17 on accounting for the costs of an equity transaction. Moreover, elements of IAS 8 are also discussed extensively in Chapter 13 on Changes in accounting policies and Chapter 14 on Errors, and are referred to in, among others, Chapter 8 on Financial statements, Chapter 11 on Statement of changes in equity, Chapter 23 on Intangible assets, and Chapter 40 on Earnings per share.

A third strong point is the inclusion of the extracts from financial statements of companies. Most, but not all, of these companies use IFRS. These extracts may be very helpful for companies that are in the process of implementing IFRS in their own statements.

The book is up to date, including exposure drafts published as late as September 2002 (ED 1 on the first-time application of IFRS and the EDs on improvements of existing standards and on amendments of IAS 32 and 39 regarding financial instruments). ED 2 on

share-based payments and ED 3 on business combinations, two revolutionary proposals, are not included.

In the limited context of this book review, I cannot discuss all the chapters in detail. To give an impression of the structure and content of the chapters, I provide an in-depth review of Chapter 16 on Business combinations. This chapter discusses goodwill only briefly, referring instead to a more extensive discussion in a separate chapter (Chapter 24).

As in most chapters, the opening section (16.1) begins with an overview of the relevant standard (IAS 22) and interpretations (SIC 9, SIC 22, SIC 28, SIC 33), followed by a treatment of the history (Section 16.2). The history section reviews the background of IAS 22, the G4+1 paper on business combinations, and the current IASB project, which has, in the meantime, resulted in the publication of ED 3. It is clearly shown that the choice in ED3 to eliminate a pooling-of-interests accounting finds its basis in the G4+1 paper.

The next section, 16.3, gives an in-depth overview of the advice from the International Organization of Securities Commissions (IOSCO) regarding the acceptability of IAS 22. The attention given in this book to IOSCO is, in my opinion, rather extensive. It is probably not fully justified, given the recent developments in the process of European Union (EU) acceptance and the limited impact of IOSCO itself in the acceptance of IFRS. In the next edition, I would replace this section by one addressing the endorsement procedures in the EU and the views of the U.S. Securities and Exchange Commission (SEC).

Section 16.4 contains a brief summary of IAS 22, with a reference to Chapter 24 for the goodwill issues. The next two sections discuss the definitions of business combinations (16.5) and the differences between acquisitions and uniting of interests (16.6). Extensive attention is given to the SEC's interpretation of IAS 22, which is very valuable for companies required to report in accordance with the U.S. Generally Accepted Accounting Principles (GAAP). The SEC has allowed foreign issuers to use IAS 22 to determine whether a business combination should be accounted for under the purchase or the pooling-of-interest method. However, the SEC has interpreted IAS 22 more strictly than the IASC had contemplated. Several practical examples are given where the SEC has not accepted the IAS 22 application of pooling-of-interests accounting for U.S. GAAP purposes (among others, Novartis, ING, and Stora Enso). This section also discusses the views in the IASB's business-combinations project in this respect.

Section 16.7 is devoted to the structuring of business combinations, including examples of creating a new holding company, legal mergers, and reverse acquisitions. An illustration is given in which the pooling-of-interests method was used in a common-control transaction: the restructuring of the Polish oil sector in the years 1997–1999. This section might benefit from a more extensive discussion of the accounting treatment of reverse acquisitions, both in consolidated and separate financial statements.

Sections 16.8 to 16.15 are devoted to acquisitions and the purchase method, including discussions on the date of acquisition, the cost of acquisition, the identifiable assets and liabilities, the measurement of the fair values of the identifiable assets and liabilities, the minority's share, and step acquisitions. These sections also include several extracts from financial statements, but only one specific worked-out example. More examples would have been helpful, both for practice and for the use of this text at universities. Such examples might illustrate which components to include or not to include when determining

the costs of acquisition, the practical problems in measuring the fair values of assets and liabilities at initial recognition, and accounting for acquisitions in stages by successive purchases. Furthermore, an issue of when control is effectively transferred is discussed rather briefly, mainly by references to IAS paragraphs, while in practice, this issue is quite difficult, especially around the balance-sheet date. The date of the transfer of control might be perceived differently by the seller from the buyer, and during the period of negotiations control might effectively rest with no party at all. And sometimes control has been transferred under highly specific conditions, such as when consent has been given by governmental agencies, and such conditions might be fulfilled after the balance-sheet date but before preparing the financial statements. Discussing these sorts of practical issues might improve the usefulness of this book.

The final two sections, 16.16 and 16.17, discuss the uniting of interests to be accounted for by using the pooling-of-interest method, and disclosure issues.

Chapter 16 is a fine example of very useful chapter, extending beyond the original text of IAS 22 by including historical perspectives, SEC views, extracts from financial statements, and examples. Other chapters follow the same structure. Including more examples and discussions of practical issues would be useful and might improve the possibilities of the book being used in university studies. However, the current text is already of great value to practitioners and students in understanding and applying IAS/IFRS. For most issues, this handbook will be preferred to using the original IFRS Bound Volume.

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Following the Money—The Enron Failure and the State of Corporate Disclosure

George Benston, Michael Bromwich, Robert E. Litan and Alfred Wagenhofer, AEI-Brookings Joint Center for Regulatory Studies, Washington, DC, 2003; ix+126 pp.

This is a big small book. It contributes to the examination of the ongoing controversy in financial reporting, which was prompted by the practices of high-profile companies, such as Enron. However, as its subtitle suggests, the book is more than just an Enron story. The authors provide an extensive and systematic analysis of suggested remedies for current reporting and disclosure problems. Some of these proposals will be helpful, while the authors believe others may be counterproductive.

The book contains four compact chapters: The Crisis in Corporate Disclosure; What's Wrong—and Right—with Corporate Accounting and Auditing in the United States; Fixing Corporate Disclosure; and Disclosure Challenges Ahead. A short appendix provides a review of selected differences between U.S. GAAP and the International Financial Reporting Standards (IFRS) of the International Accounting Standards Board (IASB).

The crisis in corporate disclosure discussed in Chapter 1 goes well beyond disclosure as such and also assigns blame to a range of practices, individuals, and organizations—for example, performance-based compensation, regulatory or quasi-regulatory entities (SEC and FASB), corporate officers, outside accountants, and members of corporate boards. A key theme is that investors are interested in projections of cash flows because they drive company valuations. A lack of confidence in disclosed financial information is held to place a drag on stock valuations.

The case that there is a crisis in corporate financial reporting and disclosure is not difficult to make. It is accomplished by citing and listing a raft of companies that have become household names due to their reporting and disclosure misdeeds. In addition, the plunge in share prices and the explosion in restatements of company financials appear to document the severity of the problem. However, the authors later note in Chapter 2 that changes in practices at the SEC may do more to explain the increase in restatements than “an apparent worsening of corporate accounting practices” (p. 34).

The Enron case is used as an example of what went wrong. While probably somewhat surprising, weaknesses with existing accounting and auditing standards, including those for special purpose entities (SPEs), are not seen as the key failings. Rather, blame is assigned to the simple failure of companies to follow these standards and of their outside accountants, among others, to enforce them. However, one feature of current GAAP, that is, fair value accounting and its implementation by Enron, is seen to play a key role in Enron’s misrepresentation of its financial performance. The authors advise, “If accounting standard setters want to reduce the likelihood of future Enrons, they should abandon current efforts to rely further on fair values for financial reports” (p. 8). This position is repeated and expanded upon in subsequent chapters.

For readers with limited time, Chapter 1 provides an excellent overview and summary of the content of the remaining three chapters.

The wrong and right of U.S. accounting and auditing are discussed in Chapter 2. A key theme is that investor confidence, something in short supply these days, requires that information in financial statements be viewed as trustworthy. Once again, the move towards fair value accounting is held to be part of what is wrong with U.S. GAAP. However, the general view is that deficiencies in standards are not the central “wrong.” Rather, the key culprit is the failure of companies to follow accounting standards and of auditors, or others (management, directors, and the SEC), to enforce them. “In short, the Enron affair does not, in our view, justify a full-scale assault on current accounting standards” (p. 19).

For financial reports to be considered “trustworthy,” the authors identify three key requirements: (1) financial reports should be prepared according to well-accepted accounting conventions; (2) these reports should be reliable and relevant; and (3) accounting and auditing standards must be enforced. Characteristic 1 is generally not seen to be a major problem. However, report reliability (Item 2) is viewed as diminished to the extent that considerable reliance must be placed upon estimates. Moreover, the greater the need to exercise judgment in implementing GAAP, the greater the potential for opportunistic decisions aimed at earnings management. The potential for the erosion of reliability motivates the authors’ objections to the expansion of fair value accounting. However, market values are considered to be relevant, when and if available, as well as

values based upon historical costs. The failings at Enron provide dramatic testimony to the havoc that can follow from the failure to enforce accounting and auditing standards.

While fair value accounting may have been a key issue in the case of Enron, it may be a stretch to dismiss its potential value simply because it might be exploited for purposes of earnings management. This is a potential weakness that is inherent in our accrual-based accounting system. The implementation of accrual accounting demands the exercise of professional judgment, and with this comes the potential for misuse. There is also very little evidence from available studies to suggest that firms have been using fair value accounting as an earnings management tool.

The authors review the accounting and auditing failures found in the Enron case. The Enron issues involved SPEs, revenue recognition, accounting for stock issuances, disclosure inadequacies, and fair value accounting for merchant investments. Of these items, the first four are seen to represent clear failures to apply and enforce GAAP. The authors provide a detailed discussion of the shortcomings in each case. However, the last item, fair value accounting, is seen to represent a flaw in GAAP. The authors believe that Enron improperly applied fair value accounting in a number of very significant investments. Further, their position is that such exploitation is inherent in fair value accounting. "We therefore believe that of all of the accounting misdeeds relating to Enron, its abuse of fair value accounting is the one that indicts the rules themselves" (p. 28).

In line with comments above on fair value accounting, the distinction made by the authors between accounting rules that are not properly followed versus those that are simply flawed is a rather fine one. The implementation of virtually every accounting standard calls for the exercise of judgment. If the propensity for their use in earnings management is the key concern, then the difference between the exploitation of a flawed versus an unflawed standard appears to be a distinction without a difference.

Accounting abuses did not originate with Enron, and the authors cite a wide range of violations from several studies of SEC enforcement actions. They note that abuses appear to be moving up the size chain of companies in more recent years. Manipulations of revenue recognition tend to top the list of the favorite tools employed by, typically, the top management of offending companies. Performance-based compensation plans, especially at large companies where they are more common, are seen to be associated with major accounting controversies. The authors do not oppose performance-based compensation, but they do argue that plan designs should require employees to bear the burden of share price declines as well as increases. In this regard, stock options are not seen to be the best compensation arrangement. A variety of suggestions for improving the employment of options are provided as well as an endorsement of recording compensation expense when options are issued.

A key "wrong" is held to be the fact that "gatekeepers" failed to fulfill their responsibilities. The authors dismiss (on the basis of few or no changes in the numbers of lawsuit filings) claims by some that a weakening of federal laws governing auditor liability contributed to the surge of accounting problems. They also highlight the very low percentage of financial statement problems among the 17,000 SEC registrants, as well as the substantial costs that would be incurred to reduce audit and reporting failures.

The roles of the AICPA, state regulators, and the SEC are likewise not seen to be sufficiently aggressive. Disciplinary actions by these bodies and organizations are viewed as being generally inadequate. The authors suggest that the disciplining of individual external auditors might have a salutary effect on the quality of audits.

Problems with the U.S. standard-setting process are also cited. These include (1) the lack of an incentive for the FASB to act quickly; (2) excessively detailed rules as opposed to concept-based standards; and (3) excessive influence on the FASB by special interest groups.

Chapter 2 offers some suggestions for fixing corporate disclosure. Recommendations break down into those dealing with standards, that is, what needs fixing and what standards should be followed. SPE accounting is viewed as not broken, but rather simply neither applied nor enforced. Opposition is registered to standards calling for fair value accounting, except in cases with "thick" markets or where trustworthy data are available from actual transactions. Recognizing expense when stock options are issued is supported.

Some possible remedies for the perceived defects in the standard-setting process itself (too slow, excessively detailed standards, and too much special interest influence) are offered. Some incremental reforms would include deadlines imposed by the SEC (speed up the process). It is noted that the FASB itself plans to rewrite U.S. GAAP in a way that might make them somewhat less rule-based. However, moving to more concept-based standards is seen as likely to be opposed by accountants and companies because the presence of specific rules is helpful in reducing exposure to legal liability. No obvious solution is seen for the excessive political pressure on the standard-setting process.

While no standard-setting process is without flaws, embracing the idea that "excessively detailed standards" is a flaw of the U.S. system is open to challenge. This common view of late probably emerged out of a sense of self-doubt associated with the exceptionally high profile accounting abuses in the U.S. We have gone through such periods before. For example, we once viewed our own manufacturing methods and systems as less effective than those of the Japanese. The detailed rules that are often a part of U.S. standards appear to have been demanded by many of those associated with the production and use of financial statements. The legal issues alone cited by the authors make a fairly compelling case against a move to concepts-based standards. Moreover, there appears to be no current evidence that suggests that concepts-based standards are superior to our more rules-based approach.

The usefulness of a single set of world standards is discussed. The global character of business and financial markets makes this a fairly obvious consideration. The comparison of financial reports from different countries would become somewhat easier. A reduction in home country investment bias would also be expected from a worldwide set of standards. However, on balance the authors are not optimistic about a single set of standards being a marked improvement.

Harmonization of GAAP issued by the FASB with IFRS issued by the IASB is seen as a possible improvement and is already underway, with a 2005 deadline to eliminate major differences in the European Union. This approach may make it somewhat easier for both bodies to ward off the political pressures exerted by special interest groups.

The standard-setting monopoly held by the FASB in the U.S. is seen to be problematic, and competition in standards is proposed. With some competition, standard-setting bodies might be more responsive to user interests than is true with the current monopolies. Controlled competition is one proposed model. This would permit companies listed in the

U.S. to use either U.S. GAAP or IFRS. Other forms of competition would permit companies to choose their reporting standards only after greater harmony has been achieved between U.S. GAAP and IFRS. Mutual recognition of standards would permit, for example, U.S. companies to list their shares on European markets using U.S. GAAP while not being required to reconcile U.S. statements to GAAP of the relevant European country. Beyond improvements in standard setting and possible competition in standards, the authors also focus on improvements in standards enforcement. As they note, "However much accounting standards may be perfected, investors will not be protected if the standards are not properly enforced" (p. 66).

The proposed approaches to improving enforcement center on more effective monitoring and better incentives. Monitoring refers to the oversight of the auditors, and the incentives are those designed to induce auditors to carry out their audits properly. The monitoring activities of the AICPA, SEC, and State agencies are seen as rather ineffective. Weaknesses due to the self-interest of the AICPA and weak penalties by all involved are highlighted.

The newest monitoring entity is the Public Company Accounting Oversight Board (PCAOB). The PCAOB will inspect firms that conduct audits of public companies, set auditing standards, and discipline both firms and individuals for misconduct.

Added incentives for top company officers to do the right thing are features of both the Sarbanes-Oxley Act as well as the more recent SEC actions. CEOs must now sign financial statements. Signing statements that turn out to be violation of GAAP can lead to fines, criminal charges, and a requirement to repay performance-based bonuses if earnings are restated. The authors are somewhat skeptical about the effectiveness of these incentives because of, for example, difficulties associated with proving fraudulent financial reporting.

A requirement to expense stock options is seen as likely to reduce the granting of stock options, reducing in turn the incentive for company officers to manage earnings. While there might in fact be some reduction in earnings management, it is important to recall that a range of other conditions will continue to provide incentives to manage earnings. As a common example, earnings might be managed up to avoid the violation of a minimum net worth covenant in a credit agreement.

Other incentives discussed that may encourage proper behavior by company officers, audit firms and individual auditors, and directors include: (1) more director independence, especially for the members of audit committees; (2) private consultations by the audit committee with internal and external auditors; and (3) the greater likelihood of legal action for the failure of key parties to properly perform their duties.

The authors are not supportive of the prohibition of audit firms from engaging in auditing as well as other services for the same client, for example, management consulting. Their view is that even with such a prohibition, there will remain an incentive to compromise the audit if the desire to retain a client is sufficiently strong. They see the solution to this potential conflict as "prohibiting (company) managers from hiring and firing auditors" (p. 73). Also discussed is the possible value of audit firm and partner rotations, as well as a requirement that the engagement partner and confirming partner sign their own names, as well as the firm's, to the audit report.

The concluding chapter opens by highlighting reasons why even trustworthy earnings may be of limited value to investors. These include (1) the historical nature of financial statements; (2) the fact that much of the value of companies is currently driven by

intangibles that are not accounted for in the financial statements; and (3) important nonfinancial data are currently not included in financial reports. In addition, information that is provided may not be organized in a way that investors find most useful. The authors indicate that dealing with this matter may be assisted by expanding the availability to users of somewhat rawer data from companies. Newer computer languages, such as Extensible Business Reporting Language (XBRL), are expected to make it possible for users to "extract firm-provided data and manipulate and rearrange them in any manner that they find useful" (p. 82).

Intangibles and nonfinancial data are linked in subsequent discussion. It is no surprise (given their opposition to fair value accounting) that the authors see a proposal to estimate the value of intangibles and record them on the books as "potentially quite dangerous" (p. 83). Instead, the authors recommend that nonfinancial information be provided that would be useful to investors in valuing intangibles. The book includes an exhibit with examples of nonfinancial measures drawn from a variety of sources (pp. 86–87).

"Potentially dangerous" is a rather strong characterization of the consequences of estimating and recording the value of intangibles on the financial statements. A wide range of intangibles is already included in the allocation of purchase prices in company acquisitions. Therefore, the estimation and recording of the value of extant intangibles would not appear to be such a great leap. It would certainly add to the representational faithfulness of company financials.

The final section of the book expands upon the earlier introduction of financial reporting and the Internet, with a focus on the potential future role of XBRL in improving the financial disclosure system. An increase in the frequency with which financial information is reported is viewed as likely to reduce the extent of earnings management and increase the focus on cash flows.

The authors' concluding comments advise against a narrow focus on simply attempting to prevent future Enrons and WorldComs. Rather, emphasis should be given to dealing with inadequacies in our current financial reporting and disclosure system. However, financial information currently being provided is still viewed as having "great value when the numbers they report are trustworthy" (p. 93). The provision of nonfinancial information and the development of advanced data provision and manipulation systems (XBRL) are two examples of how the value of the current systems might be leveraged.

A review cannot, and is not intended, to take the place of reading the book itself. As noted at the outset, this book is a small volume in terms of length but large in its abundance of ideas. This book makes significant contributions not only to the recent debate associated with high-profile accounting problems but also to larger financial reporting and disclosure issues that we will face in the future.

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*Faculty and Research, DuPree College of Management,
Georgia Institute of Technology, Atlanta, GA, USA*



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December 11–13, 2003

Hilton Clearwater Beach Resort

Clearwater, Florida

Friday, December 12, 2003

8:30 a.m. Session I

“Evidence on the Efficacy of Interest Rate Risk Disclosures by Commercial Banks”

Anwer S. Ahmed, Syracuse University; Anne Beatty, Pennsylvania State University; Bruce Bettinghaus, Michigan State University

Discussant: Dan Thornton, Queens University, Canada

Linda Allen, CUNY Baruch College

10:30 a.m. Session II

“Risk Disclosures with Asymmetric Information and Costly Investment in Information Technology”

Bjorn Jorgensen, Columbia University and Michael Kirschenheiter, Purdue University

Discussant: Robert Verrecchia, University of Pennsylvania

Masako Darrough, CUNY Baruch College

1:30 p.m. Session III

“Foreign Exchange Sensitivity-Analysis Disclosures and Market-Based Risk Measures”

Visarut Sribunnak, University of California, Berkeley, and Franco Wong, University of Chicago

Discussant: Shivaram Rajgopal, University of Washington

Steven Ryan, New York University

3:30 p.m. Session IV

“How Companies Communicate Risks: Evidence from the Italian Stock Exchange”

Sergio Beretta and Saverio Bozzolan, University of Padua

Discussant: Terry Shevlin, University of Washington

Christine Botosan, University of Utah

Saturday, December 13, 2003

8:30 a.m. Session V

“Backtesting Value-at-Risk: A Duration-Based Approach”

Peter Christoffersen, McGill University and Denis Pelletier, North Carolina State University

Discussant: Bharat Sarath, CUNY Baruch College

Steven Huddart of Pennsylvania State University

10:30 a.m. Session VI

“The Integration of Risk Management Activities: Evidence from the P & C Insurance Industry”

Elizabeth Demers, University of Rochester

Discussant: Leslie Hodder, University of Indiana

Jim McKeown, Pennsylvania State University

12:00 p.m. Closing Remarks

Shyam Sunder, Yale University

Ira Solomon, University of Illinois

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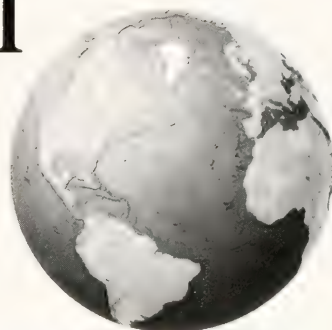
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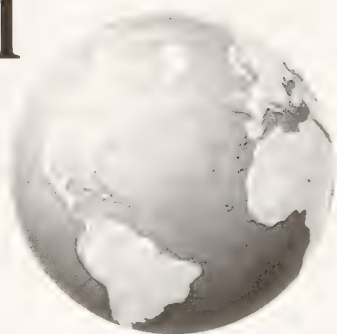
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An empirical assessment of Gray's accounting value constructs

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Abstract

Gray [*Abacus* (1988) 1] proposed a framework for a theory of cultural relevance in accounting. This renewed an interest in culture-related studies in international accounting. To date, much of this literature has been theoretical or subjectively descriptive because the elements constituting Gray's framework lack an operational foundation. This paper addresses this shortcoming by presenting research that operationalizes and evaluates the empirical usefulness of Gray's accounting subcultural value constructs of professionalism, uniformity, conservatism, and secrecy.

The paper presents the results from an accounting values survey (AVS) administered to a sample of users and preparers of financial statements in New Zealand and India. The data are subjected to multivariate analysis, and the results provide some support for the usefulness of Gray's accounting values as empirically based classificatory constructs, although they may require some adaptation and reinterpretation. Professionalism appears as the most clearly defined construct and the elements of the uniformity construct also hold together well, although appearing to attract elements of the construct of secrecy. The part of the secrecy construct concerned with the level of detail in financial statements appears to be reasonably well defined by respondents to the survey and conservatism seems to fragment into two subdimensions, perhaps representing measurement and the disclosure aspects of that construct. A question arises as to the possible existence of other, as yet unrecognized, accounting-value constructs. The findings suggest the importance of further quantitative survey research of this type to investigate the relevance of cultural factors in understanding international accounting practices.

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Keywords: International accounting; Culture; Hofstede Gray theory; Cultural relevance; Accounting theory; Surveys; Factor analysis

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1. Introduction and motivation

Gray's (1988) article in *Abacus* entitled "Towards a Theory of Cultural Influence in the Development of Accounting Systems Internationally" was a pioneering paper in the development of the idea that culture might influence accounting practices. Gray proposed a theory linking societal and accounting values that bring together constructs from the social sciences (specifically, Hofstede, 1983, 1997, 2001) and international accounting literature. The literature has since seen a renewed interest in this area, but the discussion remains largely theoretical, as few empirical studies have tested Gray's theory in a rigorous manner. Any systematic test of the Hofstede–Gray framework should presumably be preceded by a rigorous examination of the elements comprising the framework; that is, are the theoretical constructs operational and empirically measurable? This paper is motivated by that question. The study reported in the paper examines Gray's subcultural accounting-value constructs, which are fundamental to the Hofstede–Gray framework. The analysis is based upon an approach that tests for the existence of Gray's value constructs as factors explaining the responses of a large sample of users and preparers of accounting information in India and New Zealand.

Section 2 outlines Gray's theory of cultural relevance, which is central to this paper. This section also reviews the literature that was produced in the wake of Gray's theory. Section 3 details the selection of the sample and methods of analysis. Section 4 presents the analysis of the survey results using reliability, factor, and cluster analyses. Section 5 contains a discussion of the results and the conclusions of the paper, its limitations, and some suggestions for future research.

2. Background and relevant prior research

Gray's argument that culture influences accounting rests on the framework shown in Fig. 1. The framework identifies a variety of factors supposedly affecting cultural or societal values. Societal values lead to the development and maintenance of institutions within a society including educational, social, and political systems and legal, financial, and corporate structures. Once in place, these systems should reflect and reinforce societal values, as depicted in the loop at the bottom of Fig. 1. This structure is supposed to remain stable, and changes at the national level are mainly due to major external factors. International trade, investment, multinational companies, and colonization are examples of the latter.

Drawing upon Hofstede's (1980, Chap. 1) framework, Gray incorporated accounting to it by depicting how accounting practices might influence and reinforce societal values. Gray's theory presents societal values at the level of the accounting subculture. Cultural or societal values at the national level permeate through to occupational subcultures, including the accounting profession, with varying degrees of integration. The value systems of accountants are derived from societal values, with specific reference to work-related values. Accounting values, in turn, influence accounting practices, including the reporting and disclosure of information. Thus, depending on the varying degrees of external and ecological forces shaping societal values, different accounting systems

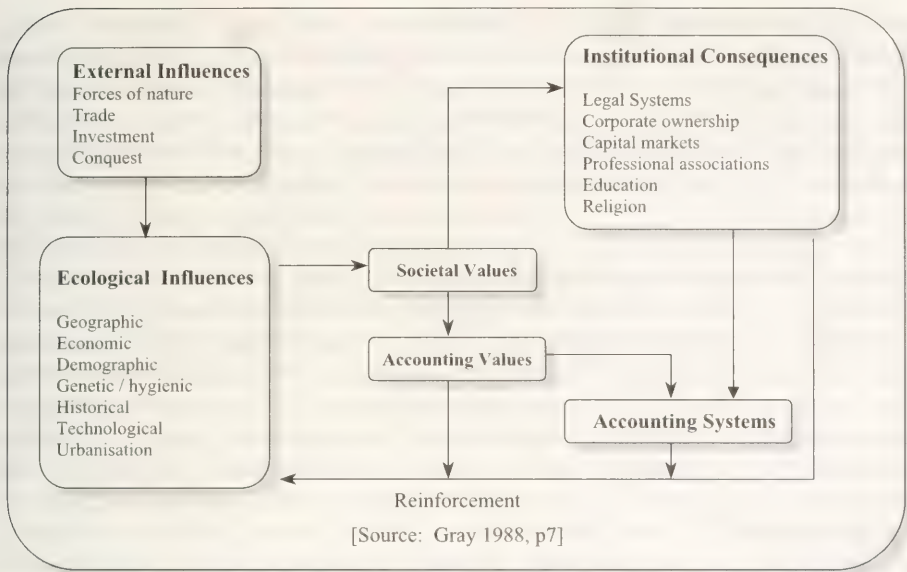


Fig. 1. Culture, societal values and the accounting subculture.

develop, reflect, and reinforce these values. Gray proposed that this framework might be used to explain international differences in accounting practices.

Gray went on to suggest that there should be a close match between cultural areas and patterns of accounting systems. This appears to be the basic argument supporting the contention that each culture should develop its own accounting systems to serve its own distinct requirements (e.g., Jaggi, 1975) and is the basis upon which Gray rests his theory of cultural relevance to accounting. Gray stated the following four hypotheses as part of his theory:

H1. The higher a country ranks in terms of individualism and the lower it ranks in terms of uncertainty avoidance and power distance, the more likely it is to rank highly in terms of professionalism.

H2. The higher a country ranks in terms of uncertainty avoidance and power distance and the lower it ranks in terms of individualism, the more likely it is to rank highly in terms of uniformity.

H3. The higher a country ranks in terms of uncertainty avoidance and the lower it ranks in terms of individualism and masculinity, the more likely it is to rank highly in terms of conservatism.

H4. The higher a country ranks in terms of uncertainty avoidance and power distance and the lower it ranks in terms of individualism and masculinity, the more likely it is to rank highly in terms of secrecy.

Empirical testing of the cultural relevance hypothesis requires operational definitions of societal values, but not necessarily of Gray's accounting-value constructs. For example, Salter and Niswander (1995) conducted a regression analysis of the relationship between

the observable attributes of financial statements and the measurements based upon Hofstede's cultural values. Such direct tests of the cultural relevance hypothesis, using Gray's constructs only as *theoretical* intervening or moderating variables, are often claimed to test Gray's theory. Lanis (2001) has argued that such an approach is not an appropriate way to test Gray's theory and has proposed a revised Hofstedian theoretical framework to avoid what he criticizes as a "black box" approach to assessing the cultural relevance hypothesis. Little or no attempt seems to have been made to confirm the empirical meaningfulness of Gray's accounting value constructs directly or to measure them objectively. Some studies that otherwise give the appearance of doing so actually use subjective judgment to measure the relevant constructs in a manner that depends upon the undemonstrated assumption that Gray's accounting values are, in fact, meaningful, empirical constructs. Examples of such studies are Eddie (1991) and Gerhardy (1990).

The study reported in this paper specifically addresses this issue. It attempts to operationalize Gray's accounting value constructs, by interpreting responses to a questionnaire survey, and to assess if these value constructs are plausible, empirically, in the sense that they reveal systematic patterns in the respondent's recorded attitudes to the questionnaire items.

The questionnaire instrument for this study was designed from scratch, given that there was no prior study to inform its content and that the literature provided no advice about the manner in which Gray's accounting constructs should be operationalized. In constructing the questionnaire, we used three main sources as guides: the general principles of questionnaire design, the format of Hofstede's value-survey module (VSM) and the objectives of the Hofstede–Gray theoretical framework, and the implications of previous theoretical and empirical work on the Hofstede–Gray framework. The literature relating to the second and third sources are discussed in the following two subsections. The general principles of the design considered in choosing questionnaire items are discussed in Section 3.

2.1. The VSM and the Hofstede–Gray framework

Hofstede's VSM questionnaire was designed for a large-scale study of work-related attitudes of 116,000 IBM employees in over 40 countries in the 1960s. The details underlying the design are discussed at length in Hofstede (1980, 2001). On the basis of a factor analysis of responses to the survey, Hofstede initially proposed four dimensions and introduced a fifth dimension in a later study reported in *Culture and Organizations: Software of the Mind* (1997). These were described by Hofstede as "individualism versus collectivism," "large versus small power distance," "strong versus weak uncertainty avoidance," "masculinity versus femininity," and "long- versus short-term orientation." A discussion of the precise meaning of these terms is not necessary for present purposes; it is sufficient to state that Hofstede related the first four of these constructs to the basic sociological concepts of: the self, relationship to authority, control of aggression, and gender role differentiation, respectively (Hofstede, 1980). The fifth construct was distinctly related to "Confucianism" in oriental society.¹

¹ Hofstede's dimensions of value have come under increasing scrutiny and criticism for a number of reasons. A recent critical appraisal of Hofstede's theory is Baskerville (2003).

Gray's conceptualization of accounting subcultural values was influenced by Hofstede's societal value constructs. More than Hofstede did, Gray based his ideas on a priori reasoning and the general (and wide) experience of international accounting regimes, as opposed to an empirically based technique such as the factor analysis of survey data. Much less has been done to test Gray's accounting value constructs, the operationalization of which is the core of this paper. Gray's accounting values are summarized in the following subsections.

2.1.1. Professionalism versus statutory control

Gray (1988, p. 8) defined professionalism as a preference for the exercise of individual professional judgment and the maintenance of professional self-regulation, as opposed to compliance with prescriptive legal requirements and statutory control. As identified by Gray, professionalism may be identified at two levels: the level of the individual making professional judgments and the statutory level, possibly concerning self-governing, professional, regulatory institutions. Professionalism is considered a core dimension of accounting values because accountants are required to make professional judgments regarding valuation and various aspects of disclosure in financial information. Such judgments are made by accountants to a lesser or greater extent in different parts of the world, depending on various factors including legal and statutory requirements and prevalent professional practice (Belkaoui, 1990, 1995). At an organisational level, the development of accounting bodies in various parts of the world reflects differing degrees of self-regulation with professional bodies in the United States and United Kingdom possessing a larger degree of autonomy and self-regulation than those in continental Europe and developing countries. Writers such as Gray and Coenenberg (1984), Holzer (1984), Nobes and Parker (1995), and Taylor and Turley (1986) support the above arguments for professionalism, and there is little disagreement that this is a significant concept in accounting.

2.1.2. Uniformity versus flexibility

Gray (1988, p. 8) defined uniformity as a preference for the enforcement of similar accounting practices between companies and for the consistent use of such practices over time, as opposed to flexibility in accordance with the perceived circumstances of individual companies. This dimension thus consists of at least two components: inter-temporal consistency in accounting practices and uniformity in the application of accounting policies and rules across companies. There has been a wide variation in the application of accounting principles across firms and between countries. In France, for instance, where, traditionally, there has been a concern with facilitating national planning, a uniform accounting plan has been followed. This is in contrast to practices in the United Kingdom and the United States, where there is a perceived need for flexibility in adopting and following accounting policies. Writers such as Arpan and Radebaugh (1985), Choi and Mueller (1984), Holzer (1984), and Nobes and Parker (1995) have provided arguments in support of treating uniformity as a central notion underlying accounting practice.

2.1.3. Conservatism versus optimism

Gray (1988, p. 8) defined conservatism as a preference for a cautious approach to measurement, to cope with the uncertainty of future events as opposed to a more

optimistic, laissez-faire, risk-taking approach. Conservatism here fundamentally means prudence or the use of caution and implies that accountants who are conservative should anticipate losses but not gains. It is considered by many as one of the most fundamental accounting concepts, even being “the most ancient and probably the most pervasive principle in accounting valuation” (Sterling, 1967, p. 110). Conservatism is usually thought to contrast widely in different parts of the world, ranging from a strongly conservative approach in Continental Europe to much less conservative attitudes among accountants in the United Kingdom and the United States. Gray suggested that such differences are reinforced by the relative development of capital markets, the differing pressures of users’ interests, and the influence of tax laws on accountants in the countries concerned. In addition to Arpan and Radebaugh (1985), Beeny (1975, 1976), Choi and Mueller (1984), Gray (1980), Nobes (1992), and Sterling (1967) have noted the importance of the concept of conservatism in the practice of accounting.

2.1.4. Secrecy versus transparency

Gray defined secrecy as a preference for a cautious approach to disclosure, considering it a fundamental accounting attribute that stems from the influence of management on the quantity of information disclosed to outsiders. Jaggi (1975) had also previously attributed this dimension to management because firms often disclose minimal information in financial statements. Some research has claimed that secrecy varies considerably among countries, especially between continental Europe and the United States (Arpan & Radebaugh, 1985; Barrett, 1976; Choi & Mueller, 1984). These differences may also be reinforced by the differential development of capital markets and the nature of share ownership, which provide incentives for disclosure (Watts, 1977).

Gray (1988) was presented as being “the first step” towards a theory of cultural relevance, but with much empirical work to follow. It is appropriate to operationalize Gray’s accounting values as empirical constructs if the usefulness of the hypotheses stated earlier are to be assessed objectively. To facilitate this objective, the following subsection reviews some research that has attempted to extend, apply, and critique the Hofstede–Gray framework that developed from Gray’s thesis.

2.2. Theoretical developments and empirical assessments of the Hofstede–Gray framework

2.2.1. Theoretical developments

Perera (1989) and Perera and Matthews (1990) adapted Gray’s theory, the former with special reference to developing countries,² in an attempt to trace the impact of accounting values upon different aspects of accounting practice. Fechner and Kilgore (1994) and Radebaugh and Gray (1993) also developed Gray’s 1988 theory to try to relate accounting values more specifically to accounting practices. The idea behind these theories is illustrated by the framework of Radebaugh and Gray in Fig. 2. The key issue with frameworks such as those identified in Fig. 2 is that these are at an abstract level and are not readily amenable to empirical testing. To the extent that these aspects of accounting

² This aspect was also discussed by Gray (1988, pp. 11–12).

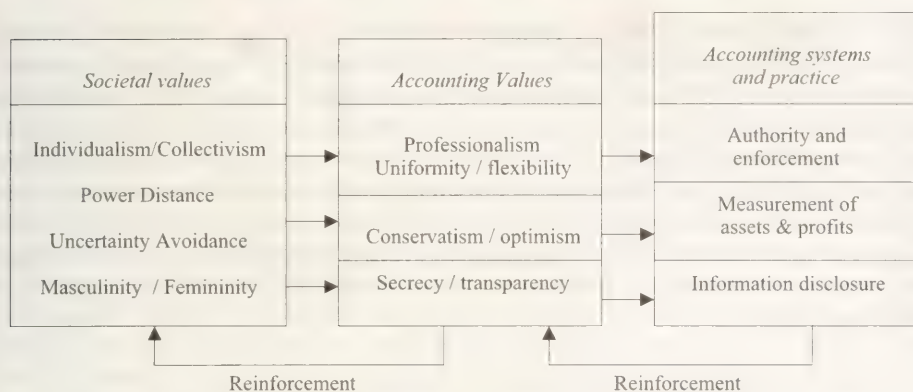


Fig. 2. Gray's accounting dimensions and measurement and disclosure (source: Radebaugh & Gray, 1993).

practice are validly related to accounting values, they may act as a guide in operationalizing the latter concepts through appropriately chosen items in a questionnaire instrument. However, this task requires further theoretical developments.

Baydoun and Willett (1995) and Willett, Nishimura, and Baydoun (1997), in a critical evaluation of Gray's theory, attempted to operationalize Gray's accounting values in terms of GAAP qualitative characteristics of good measurement and reporting practices (see Table 1) by questioning whether Gray's accounting values really served any useful purpose as intervening variables between Hofstede's dimensions of culture and the characteristics of accounting. One way of establishing if this is the case would be to

Table 1
Gray's dimensions and the qualitative characteristics of financial statements

Accounting dimensions – technical aspects		Qualitative characteristics relating to disclosure	Examples of issues relating form & content of corporate reports
Secrecy	Uniformity	<i>Uniform content & presentation</i> Consistency Comparability	Standardised accounts Accounting policies
	Conservatism	<i>Quality of information:</i> Timeliness Materiality Objectivity Verifiability Reliability Neutrality Substance over form <i>Amount of information:</i> Accountability Decision usefulness	Normal publication date Cost versus market values Cash flow accounting Lower of cost and market <i>Extent of disaggregated data:</i> Number of items disclosed Group accounts Supplementary statements

(Source: Baydoun & Willett, 1995).

see if Gray's accounting values could be operationalized as informative empirical constructs. This is an essential motivating point for the research reported in this paper.

Willett et al. (1997) reasoned that culture most clearly affects those parts of the accounting environment that are essentially social, such as the management structures of firms or the abilities, rights, and powers of different user groups to use or demand information. In particular, it was argued that culture influences disclosure practices more than measurement practices. If this analysis has validity, its implication for our current purposes is that a questionnaire should endeavor to cover both the social and technological aspects and, with regard to the latter, to include instances of both measurement and disclosure practices.

2.2.2. Empirical assessments of the cultural relevance hypothesis

A number of recent studies provide overviews of the cultural relevance literature in accounting. The cultural relevance hypothesis underpins much current work in comparative management control and environmental accounting. In a detailed review of cross-cultural research in management-control systems, Harrison and McKinnon (1999) identified several weaknesses in the literature, including what they saw as an excessive reliance on cultural value dimensions. Related to these matters, Bhimani (1999) provided a critique of cultural studies in managerial accounting, and Chow, Shields, and Wu (1999), Lau and Buckland (2000), and Tsui (2001) reported cross-cultural research in management-control systems. Chanchani and MacGregor (1999) particularly noted the lack of primary data in cultural relevance literature.

Eddie (1991) and Gerhardy (1990) are examples of the informal use and testing of Gray's theory. Gerhardy applied the theory selectively and subjectively to analyze the accounting systems of West Germany. The study of Eddie of 13 countries of the Asia-Pacific region found support for Gray's theory, confirming all the predicted signs of association between societal and accounting values. However, as with the study of Gerhardy, the study of Eddie suffered from the possibility of bias because the factors comprising each of the accounting subcultural value indices and the weights assigned to the factors comprising the index were determined subjectively.

A variety of approaches to using Gray's theory are evident in the literature. In a normative analysis, Chow, Chau, and Gray (1995) applied Gray's model to study the impact of the accounting reforms in China since 1980, concluding that the reform process would be constrained by cultural imperatives but the empirical import of the paper is unclear. The Spanish study of Amat, Blake, Wraith, and Oliveras (1999) was based on Gray (1988) but is mainly descriptive and anecdotal. Willett et al. (1997) used a subjective assessment of Gray's accounting values, similar with the fashion adopted in Eddie (1991), to analyze the nature of accounting practices in the Asia-Pacific region finding that although the Hofstede Gray analysis was consistent with the facts, a simpler explanation of the situation could be given in terms of colonialism and the institutional needs of users. A similar point was made in Nobes (1998).

The study by Salter and Niswander (1995), referred to earlier, is probably the most objective, published account relating to Gary's theory to date. It was based upon data from 29 countries, utilizing Gray's accounting values as theoretical terms and defining those values directly as elements of accounting practice. It was concluded that Gray's model was

successful at explaining actual financial-reporting practices but relatively weak in explaining extant professional and regulatory structures. It was further suggested that both the development of financial markets and levels of taxation enhance the explanations offered by Gray. The present study is probably best seen as an attempt to support studies such as that of Salter and Niswander in their use of Gray's theory in international accounting research.

Gray's theory continues to be either referred to or relied upon in ongoing research. A number of recent studies have related accounting judgments on various matters to cultural influences. Schultz and Lopez (2001) found that judgments among accountants in France, Germany, and the United States vary significantly. Arnold, Bernardi, and Neidermeyer (2001) found that as uncertainty avoidance increases, materiality estimates increase. Other instances of relevant research include the investigation of cross-national issues in voluntary disclosure and foreign listing requirements (Meek, Roberts, & Gray, 1995), earnings measurement (Cooke, 1993; Gray, 1980; Weetman & Gray, 1991), cultural influence of financial reporting in translation and legal contexts (Jaggi & Low, 2000), uniformity as a cultural or economic phenomena (Roberts & Salter, 1999), cultural impact on project-evaluation decisions (Harrison, Chow, Wu, & Harrell, 1999), cultural differences in behavioral consequences of performance evaluation and reward systems (Aswasthi, Chow, & Wu, 2001), the effect of national culture on intellectual capital and knowledge management (Chow, Deng, & Ho, 2000; Lynn, 1999) and cultural issues relating to harmonization and regulation (Dyball & Valcarcel, 1999; Farrell & Cobbin, 2001). For a broad review and commentary see Radebaugh and Gray (2001).

In summary, as may be seen from this brief review, there continues to be a strong interest in cultural relevance research in accounting and in the application of Gray's (1988) theory to a variety of issues. The impact of this literature is probably more far-reaching than may at first appear. For instance, Gray's values have recently been referred to in a medical teaching journal, which discusses cultural relevance of patient-centered interviews (Nestle, 2001). Work to date that has attempted to validate the fundamental basis of the Hofstede–Gray framework has, however, been unsystematic, limited by the availability of data or lacking a convincing operationalization of the fundamental accounting value constructs. One way to address this deficiency is to develop a direct method of assessing Gray's constructs for validity and reliability, to begin the process of accumulating data to answer the question: What is the empirical status of Gray's accounting values as cultural constructs? The following section describes the method of operationalizing Gray's accounting value constructs through a questionnaire instrument, as it was used in this research and based upon the considerations flowing from the preceding literature review.

3. Method

3.1. Operationalizing the variables

The design of the questionnaire instrument for this study was informed from a number of sources that we briefly discuss, partly to leave a trail of our reasoning and partly to refer

to later in our analysis of the survey results.³ A copy of the questionnaire instrument is found in Appendix A. The covering letter accompanying the questionnaire was brief and general, explaining the purpose of the research, obtaining informed consent, and assuring anonymity of response. It did not attempt to provide additional context to the questionnaire, such as whether the items related to public or private companies. It is acknowledged that some of the items are imprecise in nature and are open to alternative interpretations. The results reported later suggest some modification of the reasoning used in the first instance in the design of the questionnaire instrument. These are discussed in the concluding section.

The basic form and content of the instrument followed Hofstede's VSM and is referred to below as the accounting values survey (AVS). The reason for following Hofstede in this respect is that the design considerations underlying the VSM are closely related to this study by the needs of testing the Hofstede–Gray cultural relevance hypothesis. Considerable effort has gone into the theoretical development of the VSM and it has been tested and used in many different empirical contexts (see Hofstede, 1980, pp. 13–39). Just as Hofstede's VSM uses four questionnaire items to capture each cultural value construct, so each of Gray's accounting values is captured in the AVS by four items on a seven-point, equally spaced Likert-type scale.⁴ Our questionnaire thus contained 16 content items in all.

The choice of each item and its wording was informed by general principles relating to the best practice of questionnaire design. The “disagree–agree” format is discussed in Backstrom and Hirsch (1963, pp. 77–79) and Ticehurst and Veal (2000, p. 147). The items were designed to be comprehensive, simple, short, understandable, and unequivocal (Sekaran, 1992, pp. 202–209). In an attempt to prevent the possibility of the items merely reflecting obvious or linguistic similarities and lazy anchoring, the items relating to each accounting value were spread through the questionnaire instrument, four items apart. One issue of a theoretical nature that is still unclear at the present time is the need for “orthogonality” of the items. This matter generally relates to the exclusivity of the questionnaire items and, in this instance, it is complicated by the possible overlap of some of the underlying accounting value constructs implied in the literature cited earlier. Ideally, the questionnaire items should give comprehensive coverage to all accounting values, which should divide into statistically recognizable factors. In the design of the instrument, importance was placed upon simplicity and brevity to reduce the risk of a low response rate. At the time the survey was developed, we were not aware (and are not as yet aware) of any other questionnaire study that attempts to test for the existence of accounting values using primary data, and the questionnaire instrument was therefore designed, more or less, from scratch. The specific subject matter of each item was guided by the theoretical considerations described in the literature review. The departure point in this regard was the classificatory scheme implied by the analysis of Baydoun and Willett (1995) and Willett et

³ The survey is part of a larger ongoing program of research concerned with operationalizing and testing the Hofstede–Gray framework.

⁴ Hofstede's original IBM study of work-related values included dozens of questions. The VSM developed for later use contains four questionnaire items per dimension. See Hofstede (1980, 1994, 1997).

al. (1997) of the potential differential impact of cultural values on the measurement, disclosure, and social aspects of the accounting environment. The questionnaire was designed to give comprehensive coverage of these aspects of accounting.

In the final questionnaire distributed to respondents, two items relating to each of the conservatism and uniformity constructs concerned the measurement dimension and two concerned disclosure. All the secrecy items related to disclosure issues. All the professionalism items were related to the social dimension of the accounting environment. The specific content of the items in each construct is discussed below.

3.1.1. Conservatism

Items 1, 5, 9, and 13 attempted to capture the construct of conservatism. Items 1 and 13 were taken to relate to measurement and Items 5 and 9 to disclosure. Most prior theoretical work appears to take the view, based upon statements by Gray (e.g., Radebaugh & Gray, 1993), that this accounting value pertains solely to issues of measurement. Despite this, the construct is discussed here as having both measurement and disclosure aspects. For example, the idea that historic costs are more relevant than market values are for decision making, or should be used for decision making, may be interpreted as a preference for conservatism, but these are, strictly speaking, preferences concerning disclosure, not measurement, issues. Measurement issues concern what numbers represent and what their statistical or other properties are. Questions of relevance and usefulness for decision making concern judgments that determine what information to disclose and whether time should be wasted measuring something at all, not how it should be measured. Two preparers may disagree about whether to disclose market values or historic costs (because one may be more “conservative” than the other, although not necessarily more “secretive”), but they may still agree on the proper way to measure both concepts. This is probably a moot point in the context of this paper because, if Questions 5 and 9 are considered to be about measurement rather than disclosure, it makes little difference to the findings of the study, as long as it is agreed that the questions do tap the construct of conservatism.

Item 1 required respondents to state the extent of their agreement as to whether profits and assets should be valued downwards in case of doubt. Item 13 asked the respondents to indicate the extent of their agreement to the statement that in times of rising prices LIFO instead of FIFO should be used in calculations as estimates. The stronger the agreement to these statements, the greater the extent to which the respondents were judged to adopt conservative valuation approaches. Items 5 and 9 asked whether market values are more relevant than historic costs are and whether they should be used in preference to historic costs, respectively. To the extent that respondents indicated a preference towards historic costs, they would be considered conservative.

3.1.2. Uniformity

Items 2, 6, 10, and 14 relate to the uniformity construct. Items 2 and 10 were designed to relate to the measurement dimension, Items 6 and 14 to the disclosure dimension. Item two required respondents to indicate their level of uniformity by providing a specific measurement context. Agreement to externally set depreciation rates was taken to indicate higher uniformity. Item 6 approached the disclosure dimension from a cross-

sectional viewpoint, eliciting degrees of agreement to a standardized format for the purpose of reporting information. The stronger the extent of the respondent's agreement with this item, the stronger the inclination towards uniformity was taken to be. Item 10 approached the measurement issue in a time (consistency) context, asking respondents for their level of agreement to the statement that accounting policies, once chosen, should not be subsequently changed. Agreement on this question implied that the respondent degree of uniformity was high. Item 14 asked respondents about the extent of their agreement to a statement that the level of detailed standardization disclosed within financial statements should be increased. The extent to which the respondents agreed with the statement was taken to indicate their level of preference for uniform accounting disclosure practices.

3.1.3. *Secrecy*

The secrecy construct is represented by questionnaire Items 3, 7, 11, and 15. All 4 items were classified as being related to disclosure issues. Item 3 required a response to the statement that financial statements should be available to the general public rather than just to shareholders and managers. This was designed to capture the "external spread of user" aspect of secrecy noted in Baydoun and Willett (1995). Item 7 measured the respondent's attitude regarding the amount of detailed information disclosed in financial statements capturing an "information quantity" aspect of secrecy. Item 11 required respondents to indicate their agreement to the statement that information about management and owners should not be included in financial statements. As with Item 7, Item 11 relates to the information quantity and level of detail aspect of secrecy, with agreement to the item indicating higher secrecy. Item 15 was intended to capture the aspects of secrecy relating to managerial intentions. It was deliberately framed in an opposite manner to Item 11. To the extent that the respondents agreed to this statement, they were considered to hold transparency values, opposed to secrecy. Items 3 and 15 both relate to a transparency aspect of secrecy.

3.1.4. *Professionalism*

Items 4, 8, 12, and 16 relate to professionalism. The classification of all these items, as relating to the social dimension of accounting, is consistent with the theoretical literature and the interpretation given to this value in previous research. In general, this construct refers to the attributes of those who perform the accounting function rather than the characteristics of financial statements. Item 4 is a general and direct regulatory-framework question asking if the accounting profession should be self-regulated. The higher the agreement to this item, the higher the level of professionalism is taken to be. This is consistent with Gray's suggestion that professionalism is correlated with self-regulation and firmly established professional associations. Items 8 and 12, while being concerned with the attributes of accountants, attempt to relate these to the separate issues of measurement and disclosure. In both cases, agreement to assertions that accountants are the best judges of how to measure something and what should be disclosed was taken as indicating high professionalism. The last item (16) queried respondents' agreement to a statement about the standards of ethical conduct of the accountant. This was an attempt to tap into aspects of professionalism that may have

been missed in the other items. As will be seen later, it became apparent that this was probably not the case.

3.2. Pilot test

In a pilot study of the survey instrument, the questionnaire, along with a cover letter, was distributed to members of staff in a university accounting department and selected international accounting academics in New Zealand, Australia, United Kingdom, the Netherlands, Hong Kong, and India to assess the instrument for biases and to elicit comments. Only 12 usable responses were received. These were subject to factor analysis to ascertain the construct validity of the questions capturing Gray's accounting values. The questions relating to each of Gray's four accounting values were factor analyzed separately. Two of the four accounting values appeared to have subfactors: uniformity over time and across firms, professionalism at the level of the practicing accountant and at the level of governing professional body. It was also noted that in the case of conservatism and secrecy, one question accounted for about 56% of the variation, and the other three together accounted for 44% of the variation. A number of changes to the form of the final questionnaire resulted from this analysis: the wording of seven questions was altered for clarity, the introduction to the questionnaire was altered to eliminate biases, and the wording of the cover letter was altered slightly.

3.3. Sample

The sample for this study consisted of users and preparers of financial statements in two countries: New Zealand and India. The reason for choosing the sampled countries was driven by pragmatic, as well as conceptual, considerations in the context of the larger study of which this research was a part (i.e., to provide a general assessment of the usefulness of Hofstede–Gray theory). Conceptually, including as many diverse subgroups in the sample as possible is desirable from the point of view of the question dealt with in this paper because the *same* value dimensions should emerge from the data, whatever the nature of the subgroups, if Grays' constructs represent robust, subcultural features of societies. There were two preparer groups and a number of user groups, so that with the two different source countries, the sample data should provide for a reasonably reliable assessment of the empirical usefulness of the constructs. In addition to this, the pragmatic considerations of information, access to support in the target countries, and language (eliminating the problems involved in translating the questionnaire instrument) were also considerations in selecting the sample countries.

Users were identified as financial analysts and bank loan officers, and preparers were identified as practicing and nonpracticing accountants. The objective in adopting such a sampling strategy was to achieve a balance in respondents who shared professional subcultural values but who were also capable of being selected from publicly available national lists distributed across each country. A criticism of Hofstede's original 1968 study has been the use of a narrow sample: employees of a large multinational corporation (IBM), with a possibly very strong corporate culture. The sample selected for this study

Table 2

Survey sample: New Zealand

Organisation	Survey group	Category	Mailout	Sampling frame
NZ Society of Accountants	Practicing accountants	Preparers	300	Random
	Nonpracticing accountants	Preparers	300	Random
NZ Society of Financial Analysts	Financial analysts	Users	280	Population
Banks	Lending officers	Users	320	All branches
Total			1200	

attempts to overcome the problem of narrowness, while preserving the benefits of functional equivalence.

It is possible that the responses of lending officers and managers to questions directly focused on measurement and disclosure issues in accounting might not be based on considerations that are important in professional accounting work. However, as noted above, because Gray's accounting values are meant to represent a set of subcultural values or preferences, applicable across the entire accounting profession of a given country, this should probably not be seen as a weakness. To obtain an accurate, country-wide view of a country's accounting values, it is necessary to survey both the users and preparers of financial statements. The user/preparer distinction, of course, has a long tradition in accounting research that uses survey techniques to enquire into the usefulness of financial information (e.g., Buzby, 1979; Jones, Romano, & Smyrnios, 1995). In any event, as subsequent analysis demonstrates, the factor-analysis patterns remained broadly consistent across all groups of respondents, although perhaps, with some potentially interesting minor differences.⁵

The sampling strategy that was adopted is summarized in the Tables below. In both Tables 2 and 3, the first column identifies the source organisation, the second column indicates the specific group surveyed, the third column categorizes the sample as either users or preparers, the fourth column indicates the number of questionnaires mailed, and the fifth column describes the sampling method deployed.⁶

In total, 6200 questionnaires were administered to users and preparers of financial statements, and 1614 useable responses were received. Of these, 510 were from New Zealand and 1104 were from Indian respondents. The overall return rate was just over 26%, the response rate from New Zealand was 42.5% and that for the Indian sample was 22.8%. The users and preparers in New Zealand responded in almost equal proportion (41% and 44%, respectively), there was a greater variation in the Indian responses (31% and 18%, respectively). Table 4 provides a summary of response rates. The respondents for both the Indian and New Zealand sample are spread from a variety of sources with

⁵ The generalisation of the results of the study nevertheless may be limited by the fact that India and New Zealand appear to differ significantly only on power distance in Hofstede (1980).

⁶ The sampling process was "restricted" in the case of Indian bank loan officers in the sense that lists of such officers were only available for two banks at the time of the survey. Questionnaires were mailed out to officers in both banks, and, when the responses proved insufficient in number, questionnaires were also sent to officers in the 90 banks listed in the Yellow Pages of the Bombay Telephone Directory. The returned questionnaires from these sources made up the total responses in this group.

Table 3
Survey sample: India

Organisation	Survey Group	Category	Mailout	Sampling frame
Institute of Company Secretaries	Company secretaries	Preparers	2000	Random
Institute of Chartered Accountants in India	Chartered accountants	Preparers	1500	Random
Chartered and Financial Analysts	Financial analysts	Users	500	Population
Bombay Management Association	Financial analysts	Users	500	Population
Banks	Lending officers	Users	500	Restricted
Total			5000	

practicing accountants accounting for the largest contribution of responses overall (21% and 40% for India and New Zealand, respectively).

The overall response rate of 26% is comparable with the Melbourne Institute Social Science Survey, which conducts a monthly telephone survey of about 1200 households across Australia and achieves a response rate of 25%. The nature and causes of nonresponse, particularly within the Indian sample, is discussed below, and again, as a limitation of the study's findings, in the Conclusion. Table 5 presents an overview of the sample demographics.

In terms of gender, respondents in both countries were male dominated. Ninety-five percent of all Indian respondents were males, as opposed to 79% in New Zealand. With regard to age, the respondents in the two countries fell into roughly the same percentage in the different categories. The demographic regarding formal education showed the most disparity, with the Indian respondents reporting having had more formal education than the New Zealand respondents had. The extent of respondent's overseas experience also reveals differences in that, whereas only 22% of Indian respondents had any overseas experience, over one half of all New Zealand respondents had more than 1 year's experience working overseas.

It is not known why the Indian survey had a significantly lower response rate than the New Zealand survey. The way in which responses were received made statistical testing of any nonresponse bias ineffective. Dozens of survey returns from India carrying wildly varying dates were routinely received each day. For example, a response mailed on the 1st day of the month, was received on the 25th day of the same month. Other responses, completed and mailed out on the 15th were received on the 20th. Yet, others had no date. This, as with the problem of selecting a representative sample of Indian bank loan officers,

Table 4
Summary of responses

Survey group	New Zealand			India		
	Out	In	Response rate (%)	Out	In	Response rate (%)
Users	600	246	41	1500	474	31.6
Preparers	600	264	44	3500	630	18
Total	1200	510	42.5	5000	1104	22.8

Table 5

Sample characteristics

	India	New Zealand
Response rate (%)	22.8	42.5
Number of respondents	1104	510
Practicing accountants	234 (21.3%)	208 (40.8%)
Bank loan officers	34 (3.1%)	125 (24.6%)
Nonpracticing accountants	72 (6.5%)	59 (11.6%)
Financial analysts	137 (12.4%)	35 (6.9%)
Company secretaries	140 (12.7%)	–
Managers	354 (32.2%)	58 (11.4%)
Others	133 (10.9%)	25 (3.9%)
Number of male respondents	1055 (95.6%)	401 (79.4%)
Number of female respondents	48 (4.3%)	105 (20.6%)
Age of respondents		
Under 29 years	200 (18.2%)	112 (22%)
30–34 years	240 (21.7%)	86 (16.9%)
35–39 years	218 (19.7%)	105 (20.6%)
40–49 years	251 (22.7%)	120 (23.6%)
50 years and over	194 (17.5%)	86 (16.9%)
Overseas experience		
None	866 (78.4%)	247 (48.4%)
Up to 12 months	107 (9.7%)	87 (17.1%)
2 Years or more	130 (12.3%)	174 (34.0%)

is one of the many problems of eliciting survey data from a large number of respondents in a developing country.⁷ In this respect, the study reported here offers some additional experiences that may help to inform future work in this area.

4. Results

The AVS data are analyzed by means of three statistical techniques: reliability, factor, and cluster analyses. This section describes the analysis of the returned survey data under each of these headings.

4.1. Reliability analysis

This subsection discusses within-construct reliability, the sensitivity of the items composing each construct, and the relative reliability of the constructs based on Cronbach's alpha. In Table 6, the first column displays the construct and the second column lists the set of items measuring the construct. Columns 3, 4, and 5 display the reliability coefficient for New Zealand, India, and the combined data, respectively. Analysis of various combinations of items was conducted to examine the sensitivity of

⁷ The development of standards for survey design and implementation in the context of cross-national research is still in its infancy (see Japac, 2001; Lynn & Clarke, 2001).

Table 6
Reliability analysis

Construct	Items	New Zealand (510)	India (1104)	Total (1614)
Uniformity	2, 6, 10, 14	.58	.35	.56
Uniformity	2, 6, 14	.60	.41	.59
Professionalism	4, 8, 12, 16	.51	.53	.55
Professionalism	4, 8, 12	.57	.57	.60
Secrecy	3, 7, 11, 15	.38	.31	.34
Secrecy	3, 11, 15	.36	.24	.31
Conservatism	1, 5, 9, 13	.23	.18	.21
Conservatism	1, 5, 9	.29	.21	.23
Conservatism	5, 9, 13	.33	.20	.23

This table shows the results of the reliability analysis for the conservatism, uniformity, secrecy and professionalism constructs, as operationalized by the AVS.

the alpha scores to each of the items. The split-half method of measuring reliability was used. The results were consistent with those presented here.

Table 6 indicates scores of .56, .55, .34, and .21 for the constructs of uniformity, professionalism, secrecy, and conservatism, respectively, based on all four items operationalizing each of the constructs. These scores are less than the recommended threshold of .70 of Nunnally (1978). The scores for uniformity and professionalism are highest at around .60.

In the case of uniformity, there is a consistent (but probably insignificant)⁸ effect on the Cronbach alpha from dropping Item 10, that is, the item concerning the consistency principle, that once accounting policies are determined, they should not be changed. In the case of professionalism, dropping Item 16 appeared to lead to more significantly increased reliability scores. A similar effect is evident in the factor and cluster analysis results reported below.

The highest Cronbach score for the secrecy construct (as defined here) was .38. Excluding Item 15, the item concerning whether management forecasts should be included in financial statements, rather than Item 7 reduces the reliability score to .34.

The conservatism construct performed most poorly in terms of Cronbach's alpha. Excluding Item 1, on the downward revaluation of assets and profits in the presence of uncertainty, seemed to increase the reliability score, although only marginally in the case of the total sample. A comparison of the reliability scores between the Indian and New Zealand sample shows that Indian scores are lower than those for New Zealand for almost all categories, which may be due to the larger degree of variation in the demographics and the different response percentages across groups of the former. It is difficult to judge, with any confidence, the import of the reliability scores for the validity of Gray's accounting value constructs, compared with their use elsewhere (e.g., as in Eddie, 1991). Cross-cultural studies, such as Hofstede (1980, 1997) and O'Connor (1995), did not report

⁸ The authors are not aware of a test of significance for changes in Cronbach alpha scores resulting from dropping particular items.

reliability scores. These reliability scores are a limitation on this study's conclusions but may nevertheless provide a useful benchmark for use in future research.

4.2. Factor analysis

This subsection discusses the results of factor analysis of the AVS data. Theoretically, if Gray's framework is correct and the AVS constructs have been operationalized accurately, the factor analysis of the AVS responses should reveal four factors, each loading the four items associated with the corresponding accounting value. The same pattern should be evident for subsets of the data (e.g., when split by country and user–preparer groups) if the constructs represent empirically meaningful, subcultural accounting values. The results presented in this and the following subsections give some support to this proposition. They are similarly supportive of Gray's hypotheses. The detailed analysis reported here is for the combined data (1614 cases). The analysis for the subsets of data split by country and user/preparer groups present similar results, although with some additional features referred to below.

Various extraction methods and rotations were applied to the data, all showing similar factor patterns. Table 7 details the results.

Only factors with eigenvalues greater than unity were extracted. This limits identified factors to those that explain more of the variation in the data than do individual variables. The scree plot shown in Fig. 3 indicates that five factors had an eigenvalue of one or above. The Kaiser Meyer Olkin (KMO) measure of sampling adequacy for the factor analysis of the AVS was just under 0.7, which would be classified as “middling” by Kaiser (1974). Bartlett's sphericity test statistic was highly significant, suggesting that factor analysis is an appropriate way of analyzing the data. The five factors explained 49% of the variation in the data using the principle-components method. The first, second, third, fourth, and fifth factors explained 16.3%, 11.2%, 7.7%, 7.4%, and 6.4% of the variance, respectively.

For purpose of reference here and later in the paper, it is convenient to use the following codes to refer to the combinations of items that appear in the factor analysis: C_1 = Items 1 and 13 (measurement aspect of conservatism); C_2 = Items 5 and 9 (disclosure aspect of conservatism); U_1 = Items 2 and 10 (measurement aspect of uniformity); U_2 = Items 6 and 14 (disclosure aspect of uniformity); P_1 = Items 4, 8, and 12 (regulatory and technical judgment aspect of professionalism, excluding the ethical aspect contained in Item 16); S_1 = Items 3 and 15 (transparency aspect of secrecy); and S_2 = Items 7 and 11 (level of detail aspect of secrecy). These codes allow the factors identified in Table 7 and the cluster analysis reported later to be more readily related to Gray's values and the matters discussed in the literature review.

In Table 7, all loadings greater than 30% are highlighted. Given the sample sizes, it is reasonable to claim these are both statistically significant and practically significant, explaining at least 10% of the relevant variables' total variance (Hair, Anderson, Tatham, & Black, 1998). All but two of the questionnaire items (variables) can be identified with the factors in Table 7 according to the standard approach of allocating the variables, that is, moving along each row of the table and identifying the item with the factor on which it has the highest absolute loading. The two exceptions to this rule are shown shaded. It is

Table 7
Factor patterns

No.	Item description	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
6	Financial statements of all companies should have standardized formats.	.725	.035	.012	.025	.125
14	The level of detailed standardization in financial statements should be increased	.653	.024	.008	.009	.255
10	Accounting policies once chosen should not be changed	.529	.153	.347	.187	.087
2	Depreciation rules should be set externally specifically for separate group of assets	.423	.001	.225	.002	.456
3	Financial statements should be available to general public rather than just shareholders and managers	.477	.03	-.355	.032	.080
15	Management forecasts should be included in financial statements	.419	.030	.183	.371	.024
12	Professional accountants are the best judges of what to disclose in financial statements	.020	.798	.183	.038	.014
8	Professional accountants should be the best judges of how to measure a firm's financial position and performance	.173	.775	.161	.029	.025
4	Accounting profession should be self-regulated	.022	.612	.150	.01	.25
7	Only a minimum amount of detailed data should be included in financial statements	.041	.133	.693	.018	.12
11	Information about management and owners should not be included in financial statements	.138	.041	.613	.100	.114
9	Market values should be generally used instead of historical costs	.172	.045	.127	.822	.061
5	Market values are generally less relevant than historic costs	.25	.06	.150	-.726	.23
1	Profits and assets should be valued downwards in case of doubt.	.001	.071	.025	.003	.660
16	Professional accountants should maintain high standards of ethical conduct	.014	.110	.002	.01	.662
13	In times of rising prices, LIFO instead of FIFO should be used in calculation as estimates	.300	.035	.366	.00	.333
	Factor labels	Uniformity	Professionalism	Secrecy	Conservatism in disclosure	Conservatism in measurement

Rotated component matrix (a) extraction method: principal component analysis. Rotation method: Varimax with Kaiser Normalization. Rotation converged in seven iterations.

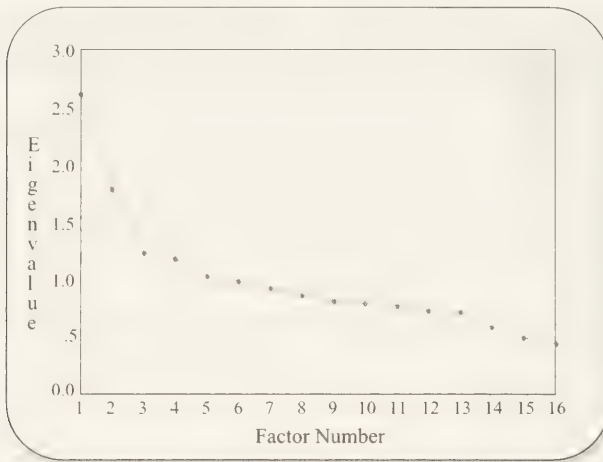


Fig. 3. Factor scree plot.

apparent that in the alternative primary allocation of these items to Factors 1 and 5, respectively, (i) it makes greater sense in terms of Gray's theory; (ii) the differences in the communalities between the standard and alternative factor assignments are small and probably statistically insignificant (less than 3%), and, in addition, (iii) under some other methods of extracting and rotating the factors (e.g., the image method with an oblique rotation), the items are factored using the standard approach precisely in this manner. It is probably unnecessary to focus too much attention on this point, in any case, because the highlighted loadings relating to Items 2, 3, 13, and 15 that appear in more than one factor provide information about how they might be interpreted in each factor on which they load. They also give insight into how either the underlying theory or survey instrument might be improved.

As can be seen, under this interpretation, Factor 1 attracts both the uniformity items and S_1 , the transparency aspect of secrecy. Factor 2 attracts P_1 , the first three of the questionnaire items intended to relate to professionalism. Factor 3 attracts S_2 , the level-of-detail aspect of secrecy; Factor 4 attracts the disclosure aspect of conservatism, C_2 ; and Factor 5 attracts the measurement aspect of conservatism, C_1 , along with Item 16, the remaining element of the intended professionalism construct dealing with ethics.

With respect to Gray's theory, it may be noted that the items representing uniformity invariably load highly on the same factor and only sometimes does an item also load significantly on another factor. Due to Factor 1 attracting S_1 , however, it is not clear that the tag of uniformity is necessarily a good description of this factor. There is, for example, a marginally significant loading of Item 13 onto Factor 1. This item split from the others in a confirmatory factor analysis and may not be important. Its presence might, for instance, be due to a problem with respondents' interpretations of the technical nature of the item (regarding the use of LIFO to value inventories). On the other hand, it could conceivably relate to the belief that LIFO produces a more accurate measure of profit in times of rising prices. The factoring patterns in Column 1 of Table 7 could therefore suggest a general

concern with the transparent provision of reliable (accurate, comparable, and objective) information.

The uniformity items factor clearly as a separate group in the New Zealand data without attracting S_1 . In the Indian data, the uniformity factor fragments into U_2 , with Item 10 combining with Item 3, a component of secrecy. Both user–preparer groups collect the uniformity items under a single factor heading, except for Item 2.⁹ Due to reasonably persistent factoring of three of the four uniformity items and the tentative nature of the results at this point in the research process, it is probably safe to continue to refer to Factor 1 as “uniformity,” but with this term being understood in the extended sense that it possibly encompasses the aspects of reliability and transparency.

The P_1 subset of the professionalism items strongly group together under Factor 2 heading under nearly all extraction methods and in the country and user–preparer subsets of the data. It seems appropriate, therefore, to use the label professionalism for this factor. This factor usually fails to attract Item 16, however, so it is reasonable to conclude that the statement about ethical standards in the questionnaire instrument is not linked to the construct of professionalism in the minds of the respondents.

Factor 3, as well as attracting S_2 , also contains a significant, negative loading from Item 3, relating to the transparency aspect of secrecy, and a significant, positive loading from Item 13, which was meant to represent a measurement aspect of conservatism. The elements of S_2 consistently factor across extraction methods and in the subsamples referred to above. The dominance of S_2 and the marginal appearance of Item 3 might be reasonably claimed to provide the justification for labeling this factor “secrecy.” However, Item 3 factored separately from S_2 in a confirmatory analysis, perhaps suggesting multidimensionality in this construct. The remaining secrecy item, Item 15, loads insignificantly on this factor (with a communality of less than 5%), but in the expected direction. Item 15 (management forecasts should be included in financial statements) loaded significantly onto three factors, suggesting a relationship of the proposition both with the extended construct of uniformity described above and the disclosure aspect of conservatism, described below.

Factors 4 and 5 contain items representing the separate disclosure and measurement aspects of conservatism, as conceptualized in Section 2. The measurement aspect C_2 loaded onto a single factor without fragmentation under all extraction methods and rotations and in the subsamples. The just more-than-marginal loading of Item 15 relating to the inclusion of management forecasts in financial statements could be interpreted as an expression of conservatism with respect to the disclosure of information, as opposed to a desire for secrecy. It therefore seems appropriate to give Factor 4 the name of “conservatism in disclosure.”

It is probably reasonable at this juncture to also label Factor 5 as an aspect of conservatism. Item 1 loads quite significantly on Factor 5 and not significantly on any other factor. Furthermore, there is a significant loading of Item 13, the other component of C_1 , on this factor. Factor 5 quite strongly attracts Item 16, the proposition that accountants should maintain high standards of ethical conduct and there is a sense in which that could be held to represent conservatism, especially if the reading of the statement is conditioned upon ethical conduct being interpreted by respondents as following cautious measurement

⁹ The results by country and by user–preparer group are available from the authors on request.

practices with respect to profit. The attraction of Item 2, under the standard method of allocating items to factors, could be explained in the same manner, that is, the statement in Item 2 that “depreciation rules should be set externally for separate groups of assets” might be interpreted as embodying a cautious approach to accounting measurement. The evidence for this interpretation of Factor 5 is not as strong as it is in the case of the other factors, however, and the cluster analysis reported below confirms that the need to treat the interpretation tentatively. Nevertheless, because the Factor 5 pattern is observable under most factoring methods and rotations in the Indian and preparer subsets of the data (but less so in the New Zealand and user subsets), the label “conservatism in measurement” for this factor seems to be as reasonable as any alternatives evident at this time.¹⁰

4.3. Cluster analysis

Cluster analysis was conducted to triangulate the results of the factor analysis reported in the preceding subsection. It is possible that cluster analyses might, by using different metrics and assumptions to those used in factor analysis, give different results and perhaps shed light on some of the points of interpretation arising from the latter. This section follows the approach to cluster analysis of Aldenderfer and Blashfield (1984).

Of the approaches to cluster analysis, the hierarchical method was adopted. Given the purpose of the research, the distance measure used was the absolute value of the Pearson correlation coefficient. The dendrogram presented in Fig. 4 uses the furthest neighbor method of clustering and gives results consistent with the factor analysis. Reading down from the top, Elements 4, 8, and 12 constitute P_1 , the professionalism factor. Elements 1 and 16 are two of the items loading on what was called the conservatism in measurement factor in Section 4.2. Elements 6, 14, 2, and 10 are the key items defining the uniformity factor, based upon the original conceptualization of that accounting value. That cluster captures Element 13, a component of C_1 (the measurement aspect of conservatism in the theoretical analysis), which presents a stronger impression of the relationship of that item with the uniformity construct than did the factor analysis (although this was marginally significant, see Table 7). Next, Elements 3 and 15 are the items making up S_1 , the transparency aspect of secrecy; Elements 5 and 9 constitute C_2 , the disclosure aspect of conservatism; and Elements 7 and 11 are S_2 , the level of detail aspect of secrecy.

The dendrogram offers some evidence of the originally expected relationship between the ethical aspect of professionalism and the other items intended to define that construct. This connection appeared to be absent from the factor analysis. In contrast, the cluster on P_1 and the relationship between S_1 and uniformity (both the U_1 and U_2 aspects) closely reflect the results of the factor analysis. The disclosure aspect of conservatism (C_2) seems to be more clearly linked to S_2 than in the factor analysis and what was labeled as the conservatism in measurement factor is absent from the cluster analysis. This warrants the caution expressed in labeling Factor 5 in the preceding subsection. Nevertheless, despite minor differences, the overall picture presented by the cluster analysis is consistent with the factor analysis. Both give some support to Gray's theory of accounting subcultural values.

¹⁰ Apart from the two instances relating to Item 13 in Factor 1 and Item 3 in Factor 3, confirmatory factor analysis showed no other evidence of multidimensionality in the constructs described in the text.

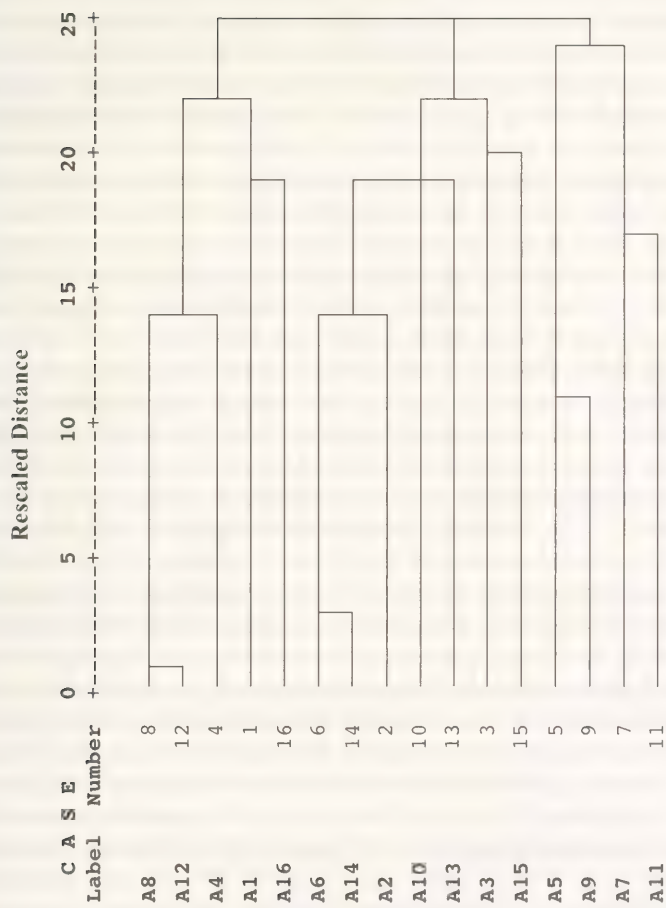


Fig. 4. Dendrogram using complete linkage.

5. Conclusions, limitations, and future research

This paper reports the first attempt to operationalize and empirically measure Gray's accounting values. It represents one way of assessing the usefulness of the Hofstede–Gray framework approach to evaluating the cultural relevance hypothesis in accounting. Gray's accounting value constructs were operationalized as 16 items in an accounting value survey questionnaire on the basis of theoretical considerations, with four items representing each of Gray's four accounting values. The questionnaire was used to survey a large sample of users and preparers of financial statements in India and New Zealand in 1995–1996.

The responses to the survey were analyzed using the reliability, factor, and cluster analyses. The originally envisaged construct of professionalism emerges most clearly as a coherent operational accounting value construct. The elements of the uniformity construct seem to attract aspects of secrecy, as originally conceptualized, and indicate that the uniformity construct might be contained within a broader accounting value construct. The secrecy construct also emerged, although less strongly than in the case of either professionalism or uniformity. Conservatism appears to split into two parts, possibly related to the two theoretical subdimensions of disclosure and measurement. There are a number of significant limitations relating to the research framework and method that require these conclusions to be interpreted cautiously, however.

The research question underlying this paper is, "Are Gray's accounting subcultural values valid empirical constructs?" An a priori strategy was adopted to answer this question. Questionnaire items were developed based upon theoretical, rather than empirical, considerations. This approach can be defended as being an appropriate way to attempt to answer the research question because it is *capable* of testing the validity of Gray's theoretical constructs. If the responses had divided nicely into four factors and clusters, with a clear interpretation consistent with Gray's theory, for example, this would have been confirming evidence for the existence of accounting values as useful empirical constructs while, if there had been no pattern in the responses at all, it would have cast doubt on their veracity. In the event, the reliability scores were lower than would have been hoped. The factor analysis did not produce four factors, but five, and the cluster analysis produced three large clusters rather than four, although it appears to be possible to interpret the results from both latter types of analysis in the context of Gray's original values.

One problem with the approach taken to instrument development in this paper, however, is that it could bias the results in favor of Gray's theory. There was no attempt to look for the existence of other accounting values, for example. The factor analysis reported in the paper explains only about 50% of the variation in the data. This suggests that there could be other, as yet unrecognized, accounting value dimensions. An alternative, more empirical approach to questionnaire design would be appropriate to investigate this possibility.

A specific issue that arises using the theoretical approach adopted here is the difficulty of clearly identifying the constructs of interest with particular questionnaire item statements. For example, the statement that "Market values should be used instead of historic costs" could have several meanings in the context of conservatism. Support for this statement could depend upon whether market values are greater or less than historic costs or it could relate to the relative reliabilities of the measurement of market values and actual costs. The assumed information set, upon which judgments of this sort are conditioned,

introduces ambiguity into the responses that may obscure the factor and cluster analyses. The reality of accounting systems, especially in an increasingly globalized environment, is that they are not directly determined by cultural values. The state of development of capital markets, the influence of tax laws, and so forth, are conditioning factors that sometimes reinforce, sometimes obscure, the impact of cultural values on accounting practice. Future research should try to take explicit account of the impact of such factors so that it may have greater relevance to practical policy making.¹¹

There is also, of course, the general question of the ability of questionnaire surveys to reveal subtle, cultural traits. It is assumed that the questionnaire responses were truthful and meaningful, and that reported attitudes, perceptions, beliefs, and values have significance for the respondents in terms of social action. The reliability of the responses can be gauged to some extent from the consistency of the responses to particular questionnaire items. For example, the factor analysis produced signs on the significant loadings (e.g., with respect to Items 5 and 9) that give some confidence that they make sense and are consistent with basic, prior expectations.

It is also assumed that the responses to the questionnaire items reflect substantive constructs rather than reactions to linguistic cues. The deliberate spreading of what were intended to be items associated with the same underlying construct was an attempt to reduce the risk of the latter effect. In addition, the explicit linking of the types of questionnaire items and their motivation to underlying theories concerning the relationships between accounting values and accounting practices was designed to enhance the substantive import of the individual items. However, the lack of specificity in the theoretical analysis and the questionnaire can easily lead to ambiguity of a type that Gray had not envisioned. It is acknowledged that different instruments may be developed that better elicit Gray's (and possibly other) accounting values.

With regard to the factor analysis, the process of assigning meaningful labels to a group of items forming a factor necessarily involves judgment. This study, as with most factor analysis, is open to the criticism that others interpreting the factor analysis results might assign different labels to factors or interpret factor loadings differently. The labeling of the factors has been guided by the literature relating to the Hofstede–Gray framework, results from reliability, factor, and cluster analyses, and the questions hypothesized to operationalize the constructs. Until such time that other primary data (preferably with as great a coverage of different countries as possible) prove otherwise, however, the conclusions presented here may provide a starting point for further AVS research.

The discussion of the interpretation of the factors above suggests three important lessons for future AVS research. These relate to (i) the problems involved in dealing with the orthogonality of the factors and questionnaire items; (ii) the possibility that as yet unrecognized additional accounting value constructs exist and the potential difficulties that may be caused for analysis by the existence of subdimensions in some of the factors; and (iii) the fact that the quantitative approach to researching the impact of culture on accounting can be potentially useful.

¹¹ The authors are grateful to an anonymous reviewer for the discussion in this and other paragraphs in the conclusion.

With respect to Point (i) in the design stage of the research, it was thought that the orthogonality of Gray's accounting values concepts might prove to be problematic when analyzing the respondents' returned questionnaires. Previous theoretical research had identified the possibility of overlap in these concepts. However, the results of the analysis were not sufficiently strongly indicative in either direction to determine if this is likely to be a problem. Orthogonal and oblique rotations of the factors did not produce significantly different results, suggesting that the natural factors are reasonably robust and independent of one another. Four of the 16 questionnaire items did load onto more than one factor, but it is not clear that this is a serious problem, or even necessarily undesirable in exploratory research. The design of more orthogonal survey items in future AVS type studies, however, should be informed by the experience reported here.

With respect to Point (ii), it was also anticipated that some of the accounting value constructs might be multidimensional. Those values with the most obvious *a priori* multidimensionality, however, had the highest reliability scores. There was some evidence in the subsamples of the existence of subdimensions but, apart from the dividing of the conservatism construct, it did not seem to be a strong feature of the total data set. This may have been a consequence of the simplicity of the survey instrument (which was deliberate) which resulted with not being able to capture the multidimensional aspects of professionalism and uniformity sufficiently well. For example, uniformity potentially has a time versus company and measurement versus disclosure subdimensions, giving at least four subdimensions. If this fact is empirically significant, it would require more questionnaire items than were used in the version of the AVS, on which the results of this paper are based, to identify these subdimensions of accounting values. Again, this supports the need for a more extended, empirically based AVS.

With respect to Point (iii), it does seem that whatever the correct choice of labels for the factors revealed in the factor analysis are, systematic, quantifiable patterns do emerge from the data and are worthy of further investigation. This remains the case even after taking into account the many limitations of the study, such as the small size of the pilot study and the inability to gauge the effect of any nonresponse bias. It is probably a point that pertains to a more important issue than whether one particular theory about the identity of accounting subcultural dimensions is confirmed by research. The test of the usefulness of an approach to research is whether it leads to new and interesting information, including new questions. This study raises a number of new and interesting questions concerning the identity and nature of accounting's cultural dimensions that would not necessarily be so clearly identified by other more qualitative approaches to the subject. Given the viewpoint that is sometimes expressed in the literature about the impossibility of gaining knowledge about cultural matters by quantitative means, this point is not without significance.

The AVS needs to be developed to address the limitations and weaknesses of design noted here and to be applied across different countries and samples of users and preparers. Such studies would contribute to the development of a repository of accounting values data for research and would help to address the current problems of lack of data associated with researching the cultural relevance hypothesis. This study aimed to provide primary data on an issue about which there is little empirical evidence. Subject to the provisos discussed, the study found some support for Gray's accounting value constructs. The development and administration of the AVS provides a potential operational foundation

for improving the application of the Hofstede–Gray framework in cross-cultural studies and will, we hope, raise the debate about the cultural relevance hypothesis in the accounting literature to one based upon a more empirical approach.

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Appendix A. The AVS

Without taking into account the recommendations of your own professional organisation to what extent do you believe the following practices are desirable? To what extent would you agree or disagree with each of the following statements. Please indicate your preference on the *equally spaced 7 point scale* from strongly agree to strongly disagree.

	Strongly agree						Strongly disagree
1. Profits and assets should be valued downwards in case of doubt.	1	2	3	4	5	6	7
2. Depreciation rules should be set externally, specifically for separate groups of assets.	1	2	3	4	5	6	7
3. Financial statements should be available to the general public rather than just to shareholders and managers.	1	2	3	4	5	6	7
4. Accounting profession should be self-regulated.	1	2	3	4	5	6	7
5. Market values are generally less relevant than historic costs.	1	2	3	4	5	6	7
6. Financial statements of all companies should have standardised formats.	1	2	3	4	5	6	7
7. Only a minimum amount of detailed data should be included in financial statements.	1	2	3	4	5	6	7
8. Professional accountants are the best judges of how to measure a firm's financial position and performance.	1	2	3	4	5	6	7
9. Market values should be generally used instead of historic costs.	1	2	3	4	5	6	7
10. Accounting policies once chosen should not be changed.	1	2	3	4	5	6	7
11. Information about management and owners should not be included in financial statements.	1	2	3	4	5	6	7
12. Professional accountants are the best judges of what to disclose in financial statements.	1	2	3	4	5	6	7
13. In times of rising prices LIFO instead of FIFO should be used in calculations as estimates.	1	2	3	4	5	6	7
14. The level of detailed standardisation in financial statements should be increased.	1	2	3	4	5	6	7
15. Management forecasts should be included in financial statements.	1	2	3	4	5	6	7
16. Professional accountants should maintain high standards of ethical conduct.	1	2	3	4	5	6	7

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The value-relevance of R&D and advertising expenditures: Evidence from Korea

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Abstract

This study examines the value-relevance of R&D and advertising expenditures of Korean firms, using a regression model based on the Ohlson [Contemp. Account. Res. (1995) 661] equity-valuation framework. Results indicate that R&D expenditures are positively associated with stock price, suggesting that capitalizing R&D expenditures is appropriate. The association is stronger for the portion of R&D expenditures that is capitalized, rather than expensed, suggesting that investors agree with management that the capitalized expenditures represent greater future economic benefits. Investors also appear to interpret fully expensed R&D expenditures as positive net present-value investments, however, suggesting that these expenditure should also be capitalized. Additional results indicate that advertising expenditures are negatively associated with stock price, and the magnitude of this negative association is similar to the association between other expenses and stock price. These findings suggest that investors believe the economic benefits of advertising expenditures expire in the current period, similar to other expenses.

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Keywords: R&D expenditures; Advertising expenditures; Value-relevance

1. Introduction

In the current environment of rapid scientific advancement and intensified global competition, many firms in Korea are increasing their R&D investments and launching new advertising projects. Whether R&D and advertising expenditures represent expected future economic benefit (are “value-relevant”) is an important accounting issue in both

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academia and practice. If expenditures provide future economic benefits, then capitalizing them is desirable; otherwise, expensing in the current period is preferred. This study investigates the value-relevance of R&D and advertising expenditures of Korean firms, using an empirical model derived from the Ohlson (1995) valuation framework.

R&D expenditures may be capitalized in Korea, whereas they are fully expensed in the United States. Studies using U.S. data provide evidence generally consistent with the value-relevance of R&D expenditures (Bublitz & Ettredge, 1989; Hirschey & Weygandt, 1985; Lev & Sougiannis, 1996). Using Korean data, Choi (1994) shows that capitalized R&D expenditures are value-relevant, but expensed R&D expenditures are not. On the other hand, evidence provided by Cho and Chung (2001) supports the value-relevance of both capitalized and expensed R&D expenditures.

Advertising expenditures are expensed universally. Findings of previous studies, regarding the value-relevance of advertising expenditures are mixed. Hirschey and Weygandt (1985) provide evidence supporting the value-relevance of advertising expenditures, whereas Bublitz and Ettredge (1989) and Choi (1994) report evidence to the contrary.

The research methods of previous studies either associate R&D and or advertising expenditures with future earnings (Cho & Chung, 2001; Lev & Sougiannis, 1996) or relate them to firm market value (Aboody & Lev, 1998; Bublitz & Ettredge, 1989; Choi, 1994; Hirschey & Weygandt, 1985). This study adopts the latter approach; however, unlike previous research, we base our empirical tests on a rigorously derived theoretical model, the Ohlson (1995) valuation framework. Ohlson expresses firm value as a linear function of accounting earnings, the book value of net assets, and other information. By fitting R&D and advertising expenditures into this framework, we find that R&D expenditures are positively associated with stock price, indicating that market participants view the expenditures as providing future economic benefits. This association is stronger for capitalized R&D than for the expensed portion, however, to the extent that capitalized R&D is judged to be a positive net present-value investment. Advertising expenditures are negatively associated with stock price, suggesting that they are regarded as expenses.

To control for the possibility of a self-selection bias, we partition our sample into two groups based on whether firms fully or partially expense R&D expenditures. We find that the expensed R&D of firms that at least partially capitalize has no significant price impact. When firms fully expense their R&D expenditures, however, their R&D expense is significantly associated with price. Because the association between price and fully expensed R&D expenditures is greater than the association between price and net book value, the market appears to regard fully expensed R&D as a positive net present-value investment. The significant difference we find in the value-relevance of expensed R&D between our two subsamples may provide an explanation for the conflicting findings of previous research on Korean R&D expenditures; previous research does not control for a possible self-selection bias.

Advertising expenditures are negatively associated with stock price. Because the magnitude of this negative association closely resembles the association between other expenses and stock price, these results are consistent with a market belief that the economic benefits of advertising expenditures expire in the current period, similar to other expenses.

The financial press has been critical of various Korean accounting practices, including the capitalization of amounts that do not represent future benefits (Ehrlich & Mann, 1998). R&D investments and advertising activities are essential for securing a firm's technological superiority and enhancing its brand values. Our findings on the information content of R&D and advertising expenditures may prove useful in future deliberations about, on modifying current accounting standards that govern the extent to which these expenditures should be capitalized.

The next section discusses previous research and the Korean accounting standards that govern R&D expenditures. Section 3 covers the model, hypotheses, sample selection, and data. Details of tests and results are included in Section 4, and the final section provides a summary and conclusions.

2. Background

2.1. Accounting standards for R&D

Press reports have criticized the amount and transparency of Korean accounting disclosures (Condon, 1998; Webb, 1998). Recently, the Korean government has encouraged Korean firms to adopt Western accounting standards, which it feels will help the country avoid problems like the recent International Monetary Fund (IMF) crisis (The Economist, 1999). The IMF criticized Korean accounting and auditing practices and has required reforms (Ehrlich & Mann, 1998; Macrae, 1998). Difficulties cited by the IMF include disclosure lapses, such as allowing the omission of key liabilities, and permitting the capitalization of amounts that do not represent future economic benefits.

Under the previous Korean accounting standard for R&D, promulgated in 1987, R&D expenditures could be capitalized when the expenditures were individually allocable to particular products or technologies, and reasonably expected future economic benefits were sufficient to cover the expenditures. If these conditions were not met, R&D expenditures were to be expensed. Under a new standard, effective in 1999, R&D expenditures are partitioned into an expensed research component and a capitalized development component. Development costs are expenditures made in the development stage that are individually allocable to new products or new technologies (including software), after technological feasibility is proven, and from which future economic benefits are probable. The new standard thus reduces the portion of R&D expenditures that can be capitalized, by requiring all expenditures incurred in the research stage to be expensed.¹ While the new capitalization rule moves Korean accounting closer to Western standards, there is still significant flexibility in the capitalization of development costs.

¹ Although considerable subjectivity over capitalization arguably exists under both old and new rules, the capitalized portion of R&D expenditures dramatically decreased when the new standard was implemented. In 1998, the year before the new standard became effective, the capitalized portion was 0.90% of sales on average; this portion decreased to 0.25% of sales in 1999. The expensed portion of R&D expenditures increased from 0.53% of sales in 1998 to 1.01% in 1999.

Because the new standard has only recently become effective, R&D data reflecting the new standard are not sufficient to provide robust evidence. Thus, data from under the previous standard (1988-1998) are used in this paper. Regardless of differences between the new and previous standards concerning capitalizing or expensing R&D expenditures, the sum of capitalized and expensed amounts is the same under both rules. For capitalization, the condition that future economic benefits are expected is equally applicable before and after the new standard. Results would thus be similar if data under the new standard were used instead.²

U.S. GAAP requires the full expensing of R&D expenditures. It allows the capitalization of software development costs, but only after the technological feasibility of new products is proven. Advertising expenditures are expensed under both Korean and U.S. GAAP.

2.2. *Prior studies*

Aboody and Lev (1998), Bublitz and Ettredge (1989), Choi (1994), and Hirschey and Weygandt (1985) infer the value-relevance of R&D and/or advertising expenditures from their associations with market value proxies, such as Tobin's q or stock returns. On the other hand, Cho and Chung (2001) and Lev and Sougiannis (1996) investigate value-relevance by examining its contribution to the generation of future earnings.

Hirschey and Weygandt (1985) provide evidence that R&D and advertising expenditures are positively associated with Tobin's q . This indicates that these expenditures are priced by the market, and thus merit capitalization as intangible assets. Choi (1994) replicates Hirschey and Weygandt (1985) using Korean data, but reports that only the portion of R&D expenditures that is capitalized under Korean GAAP is positively associated with Tobin's q .

Bublitz and Ettredge (1989) examine the association of unexpected R&D and advertising expenditures with stock returns, after controlling for unexpected revenues and other ordinary expenses. They find that unexpected R&D expenditures are not negatively associated with stock returns, but unexpected advertising expenditures are more negatively associated with stock returns than are other unexpected ordinary expenses. They interpret these results as suggesting that R&D expenditures are valued as assets, but advertising expenditures are recognized as expenses.

Although U.S. GAAP requires the full expensing of R&D expenditures, it allows the capitalization of software development costs when the technological feasibility of new products can be proven. Aboody and Lev (1998) find that changes in capitalized software-development costs are positively related to stock returns, unlike changes in expensed software-development costs. This supports the position of U.S. GAAP on the capitalization of software-development costs.

Lev and Sougiannis (1996) estimate, by industry, the contribution provided by R&D expenditures to the generation of future earnings. Their results suggest that for each

² The value-relevance of the capitalized portion of R&D expenditures could be found to be higher under the new standard. This would occur if future economic benefits are found to be more highly assured when the additional condition is imposed: that technological feasibility should be proven in the development stage prior to capitalization.

inflation-adjusted dollar of R&D expenditures, earnings of US\$1.70–2.60 are generated over the following 5–9 years, including the year of the expenditures. They present further evidence that the difference between “as-if” earnings (obtained by capitalizing R&D expenditures) and reported earnings is positively associated with stock prices. Taken together, these results suggest that the market values R&D expenditures as assets, not as expenses, contrary to the treatment prescribed by U.S. GAAP.

Cho and Chung (2001) replicate Lev and Sougiannis (1996) with Korean data. They show that 1 won (Korean currency) of R&D expenditures generates 1.25 won of earnings, on average, over the following 2–4 years, including the year of expenditures. A separate examination of the capitalized and expensed portions indicates that the capitalized portion has an effect on future earnings for a longer period than the expensed portion.³

Aboudy and Lev (1998), Choi (1994), Bublitz and Ettredge (1989), and Hirschey and Weygandt (1985) construct hypothesis tests based predominantly on intuition, rather than on valuation theory. For example, Hirschey and Weygandt and Choi do not include earnings in their models. Their findings may thus be influenced by a correlated omitted-variable problem.⁴ In contrast, the empirical tests of this study are based on a model rigorously derived from the Ohlson (1995) valuation framework. Because Korean firms have considerable discretion over whether R&D expenditures may be capitalized or expensed, the possibility also exists that the results of previous studies on Korean data may have been affected by a self-selection bias. We control for this possible influence by partitioning our sample based on whether the firms capitalize R&D. We then examine the value-relevance of expensed R&D expenditures separately for the subsamples.

3. Research design

3.1. Regression model

Ohlson (1995) derives an equity-valuation model under the assumptions that (1) the equity value of a firm is the present value of its expected future dividend stream; (2) the clean surplus relation is maintained for the change in book value of a firm's net assets; and (3) abnormal earnings exhibit a first-order autoregressive time-series process. The model is

$$p_t = k(\phi x_t - d_t) + (1 - k)y_t + \alpha v_t \quad (1)$$

where p_t = market value of a firm's equity at date t , x_t = earnings for the period ending at date t , d_t = net dividends as of date t , y_t = book value of net assets at date t , v_t = other

³ Cho and Chung (2001) is based on a comparatively small sample, 212 firm years over 2 years, 1995 and 1996.

⁴ In Choi (1994), the sample is 1453 firm years over 5 years from 1988 to 1992. In his regression, R&D and advertising expenditure variables are all scaled by sales, as in our sample. We find that the correlations between earnings (before deducting R&D, advertising expenditures, and extraordinary items) and expensed R&D and advertising expenditures are significantly positive (.23 and .40, respectively), although the correlation between earnings and capitalized R&D is not substantial (–.05). Omitting earnings from the RHS of a regression of price on expensed R&D and advertising expenditures, for example, will thus bias the estimated coefficients in a positive direction.

information at date t , $\varphi=(1+r_f)/r_f$, where r_f =the risk-free rate (thus $\varphi>1$), and $0 \leq k \leq 1$, $\alpha>0$.⁵

In Eq. (1), equity value is the weighted average of the book value of net assets (y_t) and the earnings multiple (φx_t) less net dividends (d_t), adjusted for the effect of other information (v_t). Rewriting Eq. (1),

$$\begin{aligned} p_t + d_t &= (1-k)(y_t - \text{rdcap}_t + d_t) + (1-k)\text{rdcap}_t + k\varphi(\text{sale}_t - \text{oexp}_t \\ &\quad - \text{rdexp}_t - \text{adexp}_t) + \alpha v_t \\ &= (1-k)y_t^* + (1-k)\text{rdcap}_t + k\varphi\text{sale}_t - k\varphi\text{oexp}_t - k\varphi\text{rdexp}_t \\ &\quad - k\varphi\text{adexp}_t + \alpha v_t. \end{aligned} \quad (2)$$

Above, capitalized R&D expenditures (rdcap_t) are separated from the book value of net assets before dividends ($y_t + d_t$). Thus, y_t^* is $y_t - \text{rdcap}_t + d_t$, or book value before dividends minus capitalized R&D. The earnings variable (x_t) is decomposed into sales (sale_t) minus R&D expenses (rdexp_t), advertising expenses (adexp_t), and other expenses (oexp_t), and R&D expenditures are in part capitalized (rdcap_t) and in part expensed (rdexp_t).⁶ Furthermore, because rdexp_t and adexp_t are expense items, their impact on market price is denoted as negative in Eq. (2). However, if the market believes these expenditures have future economic benefits beyond what is reflected in financial statements, R&D and advertising expenditures may be positively related to price. Finally, although Eq. (2) depicts capitalized R&D expenditures (rdcap_t) as having a positive effect on price in the same magnitude as other assets (y_t^*), the market may value rdcap_t more highly than other assets due to its potential to generate high levels of future economic benefits.

Eq. (2) is the basis of the regression model to test the value-relevance of R&D and advertising expenditures.⁷ Adding the firm subscript i , and allowing the intercept to vary yearly over the test period (1988–1998) in the equation, the regression model is:

$$\begin{aligned} P_{it} + D_{it} &= \sum_{y=88}^{98} d_y \text{YR}_{it} + b_1 \text{BV}_{it}^* + b_2 \text{RDCAP}_{it} + b_3 \text{SALE}_{it} + b_4 \text{OEXP}_{it} \\ &\quad + b_5 \text{RDEXPF}_{it} + b_6 \text{RDEXPC}_{it} + b_7 \text{ADEXP}_{it} + e_{it} \end{aligned} \quad (3)$$

where P_{it} =market value of common stock three months after the end of year t ,⁸ D_{it} =cash dividends in year t , YR_{it} =year dummy (one for the test year and zero otherwise),

⁵ Refer to Ohlson (1995) for definitions of k and α .

⁶ Tests reveal that the amount of R&D expenditures capitalized and the amount subsequently amortized are highly correlated (Pearson correlation coefficient=.907). Because our research focus is on the amounts expensed or capitalized, and to avoid problems with multicollinearity, we do not include a variable for the amortization of capitalized R&D expenditures in our regressions.

⁷ Myers (1999) provides empirical evidence that Ohlson's (1995) linear models of information dynamics tend to understate firm value, and the correlation between market price and the model's implied value is chiefly attributable to the correlation between price and net book value.

⁸ The 3-month buffer is to allow sufficient time for the filing of year t financial statements; see Section 3.3.

$BV_{it}^* = BV_{it}$ (book value of net assets at the end of year t) – $RDCAP_{it} + D_{it}$, $RDCAP_{it}$ = R&D expenditures capitalized in year t , $SALE_{it}$ = net sales in year t , $OEXP_{it}$ = other expenses in year t , $RDEXPF_{it}$ = R&D expenditures expensed for full expensers in year t , $RDEXPC_{it}$ = R&D expenditures expensed for capitalizers in year t , and $ADEXP_{it}$ = advertising expenditures in year t .

Net dividends (d_t in Eq. (2)) are replaced with cash dividends, as in Collins, Pincus, and Xie (1999). The precise nature of Ohlson's v_t ("other information" in Eqs. (1) and (2)) is unknown, and may be an omitted variable. However, if v_t is both omitted and time dependent, then the yearly intercepts may proxy for the information.

To estimate the coefficients on earnings–component variables in Eq. (3), we begin by decomposing Net Income before Extraordinary Items into $SALE_{it} - OEXP_{it} - RDEXP_{it} - ADEXP_{it}$, as in Eq. (2). Following Aboody and Lev (1998), $RDEXP_{it}$ is then broken down into two variables. For firm years with R&D expenditures fully expensed, $RDEXP_{it} = RDEXPF_{it}$, but $RDEXPC_{it} = 0$. For firm years with R&D expenditures at least partially capitalized, $RDEXPC_{it} = RDEXP_{it}$, but $RDEXPF_{it} = 0$. In this way, the coefficient on $RDEXPF_{it}$ will capture the market reaction to R&D expensing for "full expensers," and the coefficient on $RDEXPC_{it}$ will represent the market reaction to R&D expensing for (at least partial) capitalizers.⁹ All variables, including the yearly intercepts, are deflated by $SALE_{it}$. This causes the variable $SALE_{it}$ on the RHS in Eq. (3) to become a unit vector, and the coefficient on the fourth term then becomes the common intercept.¹⁰

3.2. Hypotheses

The coefficients on the Eq. (3) variables BV_{it}^* , $SALE_{it}$, and $OEXP_{it}$ appear in Eq. (2) as

$$b_1 = 1 - k; \quad b_3 = k\varphi; \quad \text{and} \quad b_4 = -(k\varphi).$$

Because $0 \leq k \leq 1$ and $\varphi > 1$, it is anticipated that

$$0 \leq b_1 \leq 1; \quad b_3 \geq 0; \quad \text{and} \quad b_4 \leq 0.$$

Similarly, the coefficient on $RDCAP_{it}$ (b_2) is $1 - k$, and those on $RDEXP_{it}$, $RDEXPC_{it}$, and $ADEXP_{it}$ (b_5 , b_6 , and b_7) are all $-(k\varphi)$. Thus,

$$0 \leq b_2 = b_1 \leq 1; \quad \text{and} \quad b_5, b_6, b_7 \leq 0.$$

We begin by testing whether the coefficient on $RDCAP_{it}$ is consistent with the above reasoning. That is, if the expenditures represented by $RDCAP_{it}$ are expected to provide

⁹ The number of full expensers, full capitalizers, and partial capitalizers of R&D are 1511 (47%), 305 (10%), and 1375 (43%), respectively. We combine the subsamples of full and partial capitalizers prior to conducting statistical tests because full capitalizers are comparatively few.

¹⁰ Barth and Kallapur (1996) report that including a scale proxy as an independent variable and reporting White's (1980) t statistics is more effective than deflation for addressing problems related to scale. In contrast, Easton (1998) finds that regressions of market value on firm characteristics may lead to coefficient estimates that capture only scale effects. Our results are qualitatively similar when tests are repeated using $SALES_{it}$ as an independent variable and deflating by the number of shares outstanding. These results are available from the authors.

future economic benefit, its coefficient, b_2 , should be greater than 0. Our first (alternative) hypothesis is thus

$$H_1: b_2 > 0.$$

The other R&D expenditure variables, $RDEXPF_{it}$, $RDEXPC_{it}$, and $ADEXP_{it}$, are expense items. Based on Eq. (2), their coefficients should approximate the coefficient on $OEXP_{it}$, or b_5 , b_6 , $b_7 \leq 0$. Market participants may, however, believe that these R&D and advertising expenditures represent future economic benefits beyond what is implied by their financial statement presentation. To test for this, alternative hypotheses concerning the coefficients on $RDEXPF_{it}$, $RDEXPC_{it}$, and $ADEXP_{it}$ (b_5 , b_6 , and b_7) in Eq. (3) are:

$$H_2: b_5 > b_4,$$

$$H_3: b_6 > b_4,$$

and

$$H_4: b_7 > b_4.$$

The above hypotheses suggest that if the economic benefits from $RDEXPF_{it}$, $RDEXPC_{it}$, and $ADEXP_{it}$ do not expire entirely in the current period, their coefficients will be higher than the coefficient on $OEXP_{it}$, b_4 .

Stronger forms of the above four hypotheses are:

$$H_{1s}: b_2 > b_1,$$

$$H_{2s}: b_5 > b_1,$$

$$H_{3s}: b_6 > b_1,$$

and

$$H_{4s}: b_7 > b_1.$$

In H_{1s} , we are testing whether $RDCAP_{it}$ represents future economic benefits beyond what is implied by its financial-statement presentation. In Eq. (2), the theoretical coefficients on y_i^* (net book value) and $rdcap_i$ (capitalized R&D) are each $1 - k$. The coefficient on BV_{it}^* , b_1 , thus provides an estimate for $1 - k$. We compare the coefficient on $RDCAP_{it}$, b_2 , to b_1 to test whether $RDCAP_{it}$ is viewed by the market as providing future economic benefits beyond this theoretical value. Alternatively, H_{1s} tests whether the market expects greater future benefit from a dollar of capitalized R&D than from a dollar of ordinary net assets. Moreover, if one considers the cross-sectional estimate of the coefficient on BV_{it}^* as the market's estimate of a normal return, the four stronger hypotheses above test whether the market regards each expenditure ($RDCAP_{it}$, $RDEXPF_{it}$, $RDEXPC_{it}$, and $ADEXP_{it}$) as a *positive net present-value investment*, regardless of its classification into asset or expense under GAAP.

Under Korean GAAP, the condition that future economic benefits are reasonably expected should be met for the capitalized portion of R&D expenditures; otherwise, these

Table 1

Derivation of research sample of 3191 firm-year observations, 1988–1998

Listed on Korean Stock Exchange (1988–1998)	6875 firm years ^a
Necessary accounting and stock price data available for December fiscal year-end firms	4609 firm years
Book value of net assets positive for years t and $t - 1$	4118 firm years
Stock return data available for years $t - 1$, $t - 2$, and $t - 3$	3790 firm years
R&D expenditures greater than 0	3191 firm years (sample)

^a 625 firms \times 11 years = 6875 firm years.

expenditures should be expensed. We thus expect that the value-relevance of $RDCAP_{it}$ is higher than that of $RDEXPF_{it}$ and $RDEXPC_{it}$, or

$$H_5: b_2 > b_5,$$

and

$$H_6: b_2 > b_6.$$

Together, H_{1s} – H_{4s} , H_5 , and H_6 enable comparisons among the market valuations of ordinary assets (BV_{it}^*) and R&D expenditures.

3.3. Sample selection and variable measurements

The sample consists of firms listed on the Korean Stock Exchange from 1988 to 1998, a period during which firms were allowed to capitalize R&D expenditures when future economic benefits were reasonably expected from the expenditures. Accounting data are retrieved from the Korea Investors Service database, and stock price and returns data are from the Korea Securities Research Institute database. To be included in the sample, necessary accounting and market data must be available. In addition, the sample is confined to firms with December fiscal year-ends, with positive net asset book values for the sample and previous years, and with R&D expenditures in the sample year. The resulting sample has 3191 firm years from 1988 to 1998, inclusive. The sample selection procedure is summarized in Table 1.

In Eq. (3), the market value of common stock (P_{it}) is as of the end of March in year $t + 1$. This allows a 3-month filing period for year t financial statements, to ensure that market value is measured after the release of the information. Other expenses ($OEXP_{it}$) are all expenses typically found in earnings before extraordinary items, including amortization of capitalized R&D, but excluding R&D expense and advertising expense.

4. Results

4.1. Descriptive statistics

Table 2 reports the means and medians of the main independent variables for the sample. The number of observations is the smallest (151) in 1988 and the greatest (352) in

Table 2

Descriptive statistics of variables: yearly means/medians, 3191 firm years, 1988–1998

(A) Mean/median of sample firm attributes^a

Year	<i>n</i>	Total assets (₩ billion ^b)	Book value (₩ billion)	Market-to-book ratio	DE ratio ^b	Capitalization intensity
1988	151	278/103	70/28	1.755/1.592	2.972/2.357	0.301/0.000
1989	184	294/102	82/33	1.641/1.519	2.669/2.087	0.251/0.000
1990	228	359/105	99/30	1.207/1.124	2.787/2.196	0.271/0.000
1991	292	448/110	132/32	1.009/0.873	3.169/2.391	0.301/0.000
1992	318	479/117	136/35	1.854/1.074	7.830/2.376	0.350/0.022
1993	327	522/130	154/40	1.501/1.306	3.186/2.236	0.352/0.056
1994	326	611/149	180/49	1.959/1.616	3.068/2.218	0.345/0.044
1995	334	751/161	222/53	1.423/1.023	4.762/2.188	0.355/0.028
1996	344	877/194	249/58	1.479/0.933	4.211/2.172	0.378/0.054
1997	352	1067/205	255/55	0.627/0.413	6.537/2.574	0.331/0.008
1998	335	1211/200	348/70	0.823/0.569	3.780/1.669	0.268/0.000

(B) R&D and advertising expenses as percentages of sales

Year	<i>n</i>	SALE _{<i>it</i>} (₩ billion)	% OEXP _{<i>it</i>} ^d	% RDCAP _{<i>it</i>}	% RDEXP _{<i>it</i>}	% ADEXP _{<i>it</i>}
1988	151	351/100	96.6/97.6	0.30/0.00	0.18/0.07	0.72/0.41
1989	184	329/97	96.5/98.0	0.50/0.00	0.29/0.10	0.82/0.36
1990	228	353/100	97.1/96.2	0.60/0.00	0.40/0.12	0.84/0.40
1991	292	389/101	96.5/95.8	0.74/0.00	0.47/0.14	0.81/0.46
1992	318	398/99	96.8/91.8	0.81/0.00	0.48/0.13	0.86/0.32
1993	327	450/106	96.6/96.5	0.77/0.00	0.59/0.14	0.80/0.34
1994	326	510/122	95.6/94.2	0.91/0.01	0.63/0.15	0.99/0.32
1995	334	631/135	95.1/95.0	0.98/0.01	0.69/0.17	0.97/0.34
1996	344	738/163	97.5/95.7	1.10/0.01	0.60/0.13	0.89/0.33
1997	352	873/167	98.6/102.1	0.73/0.00	0.57/0.16	0.84/0.25
1998	335	1002/157	98.2/100.3	0.90/0.00	0.53/0.17	0.59/0.15

Variable definitions: DE ratio = the debt-to-equity ratio; SALE_{*it*} = net sales for firm *i* in year *t*; OEXP_{*it*} = expenses other than R&D, and advertising, used to determine earnings before extraordinary items from net sales; RDCAP_{*it*} = capitalized R&D; RDEXP_{*it*} = R&D expenses; ADEXP_{*it*} = advertising expenses; and capitalization intensity = R&D capitalized/R&D expenditures = R&D capitalized/(R&D capitalized + R&D expensed).

^a Total assets, book value of net assets, and market-to-book ratio are as of the end of each year.

^b US\$1 is approximately 1200 won (₩1200).

^c There were four observations with DE > 500; two in 1992, one in 1995 and one in 1997. Without those extreme DE observations, the mean DEs are 2.948 in 1992, 2.923 in 1995, and 4.187 in 1997.

^d %_{*it*} indicates the percentage value from dividing the yearly mean/median of the variable by the corresponding yearly mean/median of SALE. Thus, each mean/median %_{*it*} variable, if multiplied by the corresponding mean/median of SALE, will become the yearly mean/median of the variable.

1997. Total assets, book value, and SALE_{*it*} exhibit distinctly increasing trends. The means of these variables are much larger than the medians, because there are a few large firms in the right tails of the variable distributions. Similarly, the yearly DE ratio means are consistently larger than the medians. The market-to-book ratio means (and most medians) are consistently greater than 1 until 1997 and 1998, during the Korean “IMF financial crisis.” Capitalization–intensity ratios are calculated as the proportion of total R&D

Table 3
Pearson product correlations ($N=3099$)

	BV _{it} *	RDCAP _{it}	OEXP _{it}	RDEXPF _{it}	RDEXPC _{it}	ADEXP _{it}
$P_{it} + D_{it}$	0.609***	0.196***	-0.259***	0.092***	0.057**	0.007
BV _{it} *		0.030	-0.149***	0.117***	0.058**	-0.007
RDCAP _{it}			0.048**	-0.176***	0.121***	0.026
OEXP _{it}				-0.150***	-0.145***	-0.402***
RDEXPF _{it}					-0.156***	0.093***
RDEXPC _{it}						0.132***

All variables are deflated by SALE_{it}.

Variable definitions: P_{it} = market value of firm i 3 months after the end of year t ; D_{it} = cash dividend in year t ; BV_{it}* = BV_{it} (book value of net assets at the end of year t) - RDCAP_{it} + D_{it} ; RDCAP_{it} = capitalized R&D; OEXP_{it} = all expenses (including cost of goods sold and income tax expenses) other than R&D expense, advertising expense, and extraordinary gains or losses in year t ; RDEXPF_{it} = R&D expenditures expensed by firms that fully expense in year t ; RDEXPC_{it} = R&D expenditures expensed by firms that capitalize in year t ; and ADEXP_{it} = advertising expenses.

Correlations are calculated with the same data used for regression estimates of Eq. (3). Extreme values are eliminated from the Eq. (3) data if the absolute value of RSTUDENT is greater than three or the absolute value of DFFITS is greater than $3(p/n)^{1/2}$, where p and n are the number of parameters and observations, respectively (Belsley et al., 1980).

* Significant at .05 (two-tailed).

** Significant at .01 (two-tailed).

*** Significant at .001 (two-tailed).

expenditures capitalized. These ratios also exhibit means consistently greater than their medians, signifying a skewed distribution.

OEXP_{it}, RDCAP_{it}, RDEXP_{it}, and ADEXP_{it} are each expressed in the table as a percentage relative to SALE_{it}. The mean of OEXP_{it} ranges from approximately 95% to 98% of SALE_{it} over the period, with a median of similar magnitude. R&D expenditures (RDCAP_{it} and RDEXP_{it}) increase for the most part until 1996, but then decrease slightly in 1997 and 1998 during the financial crisis. The mean of RDCAP_{it} is 0.30% in 1988, but increases to 1.10% of SALE_{it} in 1996. The mean of RDEXP_{it} increases from 0.18% in 1988 to 0.69% of SALE_{it} in 1995. ADEXP_{it} also shows an increasing trend until 1996, the year before the IMF financial crisis, but the rate of increase is not as distinct as for RDEXP_{it} and RDCAP_{it}. The means of RDCAP_{it}, RDEXP_{it}, and ADEXP_{it} are all considerably larger than the medians, indicating that their distributions are highly skewed. In particular, the medians of RDCAP_{it} are 0 in most of the years.¹¹

Pearson product correlations among our research variables are reported in Table 3. Outliers are identified from the regression of Eq. (3), using the RSTUDENT and DFFITS diagnostics discussed in Belsley, Kuh, and Welsch (1980), and are eliminated for robustness.¹² This process reduces the number of observations to a sample size of 3099

¹¹ To be included in the sample, R&D expenditures should be positive. Because R&D expenditures are the sum of RDCAP and RDEXP, RDCAP is included if RDEXP is positive.

¹² Observations are identified as outliers in regressions if the absolute value of RSTUDENT is greater than 3 or the absolute value of DFFITS is greater than $3(p/n)^{1/2}$, where p and n are the number of parameters and observations, respectively.

firm years. All of the independent variables (all scaled by $SALE_{it}$) are significantly correlated individually with $P - D_{it}$ (also scaled by $SALE_{it}$), except for $ADEXP_{it}$.

$RDEXPF_{it}$, $RDEXPC_{it}$, and $ADEXP_{it}$ are negatively correlated with $OEXP_{it}$ (all P values $< .001$). $RDCAP_{it}$ is positively correlated with $OEXP_{it}$ ($P < .01$). Although not tabulated here, the correlation between earnings (before deducting R&D, advertising expenditures, and extraordinary items) and $RDCAP_{it}$ is negative (-0.048 , $P < .01$), but the correlations between earnings and $RDEXPF_{it}$ and $RDEXPC_{it}$ are substantially positive (.150 and .145, respectively, both P values $< .001$). Together, these correlations suggest that firms tend to capitalize R&D when earnings are low (and other expenses are high), but expense R&D when earnings are high. While many of the independent variables are significantly correlated, diagnostics suggest that multicollinearity is not a problem in our subsequent regressions.¹³

4.2 Main results

Table 4 presents pooled regression results. The significance of each regression coefficient is tested with a White's (1980) t statistic, against the null that the coefficient value is 0. Panel A of Table 4 reports coefficient estimates and test results. As stated in Section 3.2, the theoretical values of the coefficients on BV^*_{it} and $OEXP_{it}$ are $b_1 = 1 - k$, and $b_2 = -(k\phi)$. Thus, it is predicted that $0 \leq b_1 \leq 1$, and $b_2 \leq 0$. The alternative hypotheses about the coefficient on $RDCAP_{it}$ (b_3) and the coefficients on $RDEXPF_{it}$, $RDEXPC_{it}$, and $ADEXP_{it}$ (b_4 , b_5 , and b_6) are $b_3 > 0$ and b_4 , b_5 , and $b_6 > b_3$. The stronger form of the above alternative hypotheses are $b_3 > b_1$ and b_4 , b_5 , and $b_6 > b_1$. Although our alternative hypotheses imply one-tailed P values, we report two-tailed P values to be more informative.

If one assumes that the estimated coefficient on BV^*_{it} (0.663, $P < .001$) approximates its theoretical value of $1 - k$, then $k = .337$. If the coefficient on $OEXP_{it}$ (-1.026 , $P < .001$) may also be regarded as reasonably close to its theoretical value of $-(k\phi)$, then we can infer a value for the earnings multiple (ϕ) of about 3. The coefficients on $RDCAP_{it}$ and $RDEXPF_{it}$ (7.264 and 4.240) are significantly greater than 0 ($P < .001$), suggesting that the market views capitalized and fully expensed R&D expenditures as providing future economic benefits, like assets. Furthermore, Panel B of Table 4 shows that the coefficient on $RDCAP_{it}$ is significantly greater than that on BV^*_{it} ($P < .001$), indicating that the market values capitalized R&D expenditures more highly than other assets, that is, as a positive net present value investment. These results provide support for H_1 and H_{1a} . Because the coefficient on $RDEXPF_{it}$ is significantly positive, and the coefficient on $OEXP_{it}$ is significantly negative, H_2 is also supported; Panel B of Table 4 shows that the difference between these two coefficients is significant ($P < .001$). Moreover, H_{2a} is also supported; the coefficient on $RDEXPF_{it}$ is significantly greater than the coefficient on net book value, BV^*_{it} . As discussed in Section 3.2, this result is consistent with fully expensed R&D representing a positive net present-value investment, and argues in favor of (at least partial) capitalization.

¹³ Variance Inflation Factors (VIF, Belsley et al. 1980) for all independent variables are less than 1.4. Kennedy (1992) suggests a VIF greater than 10 indicates harmful multicollinearity.

Table 4

Coefficient estimates from regressions of with-dividend price on R&D-related variables, advertising expenses, and other control variables; all variables deflated by sales

$$\text{Model: } P_{it} + D_{it} = \sum_{i=1}^{98} d_i YR_{it} + b_1 BV_{it}^* + b_2 RDCAP_{it} + b_3 SALE_{it} + b_4 OEXP_{it} + b_5 RDEXPF_{it} + b_6 RDEXPC_{it} + b_7 ADEXP_{it} + e_{it}$$

(A) Coefficient estimates and test statistics^a

Variable	Coefficient	White's <i>t</i> statistic
BV _{it} [*]	0.663	23.8***
RDCAP _{it}	7.264	10.5***
OEXP _{it}	1.026	10.1***
RDEXPF _{it}	4.240	4.08***
RDEXPC _{it}	0.832	0.91
ADEXP _{it}	-1.454	-7.31***
Adjusted <i>R</i> ²	.542	
<i>N</i>	3099	

(B) Coefficient difference estimates and test statistics^b

	Coefficient difference estimate	White's <i>t</i> statistic
RDCAP _{it} - BV _{it} [*]	6.601	9.54***
RDEXPF _{it} - OEXP _{it}	5.266	5.13***
RDEXPC _{it} - OEXP _{it}	1.858	2.07*
ADEXP _{it} - OEXP _{it}	-0.428	-2.56*
RDCAP _{it} - RDEXPF _{it}	3.024	2.59**
RDCAP _{it} - RDEXPC _{it}	6.432	5.38***
RDEXPF _{it} - BV _{it} [*]	3.577	3.44***
RDEXPC _{it} - BV _{it} [*]	0.169	0.17
ADEXP _{it} - BV _{it} [*]	-2.117	-10.79***

All variables, including the yearly intercepts, are deflated by SALE_{it}. Thus, the SALE_{it} variable in Eq. (3) becomes a unit vector, and its coefficient is a common intercept. Intercepts are not tabulated here for brevity. Variable definitions: P_{it} = market value of firm *i* 3 months after the end of year *t*; D_{it} = cash dividend in year *t*; YR_{it} = a year dummy variable with 1 for the test year and 0 otherwise; $BV_{it}^* = BV_{it}$ (book value of net assets at the end of year *t*) - $RDCAP_{it} + D_{it}$; $RDCAP_{it}$ = capitalized R&D; $SALE_{it}$ = net sales for firm *i* in year *t*; $OEXP_{it}$ = all expenses (including cost of goods sold and income tax expense) other than R&D expense, advertising expense, and extraordinary gains or losses in year *t*; $RDEXPF_{it}$ = R&D expenditures expensed by full expensers in year *t*; $RDEXPC_{it}$ = R&D expenditures expensed by capitalizers in year *t*; and $ADEXP_{it}$ = advertising expenses.

^a Extreme values are eliminated if the absolute value of RSTUDENT is greater than 3 or the absolute value of DFFITS is greater than $3(p/n)^{1/2}$, where *p* and *n* are the number of parameters and observations, respectively (Belsley et al., 1980). Regression results are based on 3099 firm years, after eliminating extreme values. White's (1980) *t* statistics test the null hypothesis that the coefficient value equals 0.

^b White's (1980) *t* statistics test the null hypothesis that the coefficient values are equal.

* Significant at .05 (two-tailed).

** Significant at .01 (two-tailed).

*** Significant at .001 (two-tailed).

Panel B of Table 4 shows that the coefficient on RDEXPC_{it} is significantly greater than the coefficient on OEXP_{it} ($P < .05$). This result supports H₃, suggesting that the economic benefits of expensed R&D do not appear to expire entirely in the period in which the

Table 5
Coefficient estimates (and White's t statistics) from yearly regressions of with-dividend price on R&D related variables, advertising expenses, and other control variables, all variables deflated by sales.

(A) Coefficient estimates and test statistics								
Year	BV _{it} [*]	RDCAP _{it}	OEXP _{it}	RDEXP _{it}	RDENPC _{it}	ADEXP _{it}	n	Adjusted R ²
1988	1.191 9.2***	14.152 4.01***	0.992 1.14	-2.774 -0.72	14.071 2.16*	-0.792 -0.62	145	657
1989	1.087 10.08***	15.090 8.69***	0.555 -1.27	8.281 0.79	7.233 1.27	2.468 3.14**	178	622
1990	0.834 12.44***	7.228 3.85***	0.057 0.13	3.858 1.25	2.207 0.77	1.203 1.95	227	751
1991	0.580 5.62***	16.24 1.19	-1.529 3.12**	-4.691 1.73	0.168 0.08	1.906 3.13**	284	560
1992	0.613 6.96***	8.734 4.78***	0.251 -0.66	8.473 1.67	2.117 1.30	0.522 0.98	310	608
1993	0.836 10.18***	6.443 8.01***	0.525 -1.72	8.558 1.68	0.359 0.15	0.643 1.02	316	608
1994	0.718 7.32***	8.896 4.08***	3.153 -5.09***	8.187 1.84	-1.079 1.42	3.975 -5.90***	316	572
1995	0.696 9.53***	9.293 3.68***	1.481 4.50***	-4.810 1.78	0.784 0.26	2.080 3.82***	328	537
1996	0.632 7.91***	8.690 4.32***	-1.588 4.02***	3.324 1.14	1.467 0.50	-0.975 1.20	334	584
1997	0.566 9.29***	5.132 3.66***	0.848 -4.85***	4.499 1.73	0.190 0.10	-0.318 -0.55	345	510
1998	0.487 7.26***	6.966 3.51***	0.607 -3.84***	5.993 2.13*	2.531 0.91	1.497 1.67	316	393
Mean	0.767	7.841	0.873	4.125	2.319	1.489		
z1	39.94***	17.27***	11.82***	-4.826***	1.517	-7.530***		
z2	17.93***	8.506***	-3.693***	5.768***	1.584	-4.323***		
Total N	3099							
								Mean adjusted R ² = 582

(B) Mean coefficient difference estimates and test statistics

	$RDCAP_{it}$	BV_{it}^*	$RDEXPF_{it}$	$OEXP_{it}$	$RDEXPC_{it}^*$	$OEXP_{it}$
Mean	7.074		4.998		3.192	
z1	15.45***		5.91***		2.73**	
z2	8.04***		5.70***		4.33***	
	$ADEXP_{it}$	$OEXP_{it}$	$RDCAP_{it}$	$RDEXPF_{it}$	$RDCAP_{it}$	$RDEXPC_{it}^*$
Mean	-0.616		3.716		5.522	
z1	-3.24**		2.76**		5.86**	
z2	-2.46*		2.51*		5.52***	
	$RDEXPF_{it} - BV_{it}^*$	$RDEXPC_{it}$	BV_{it}^*	$ADEXP_{it}$	BV_{it}^*	
Mean	3.558	1.552		-2.256		
z1	4.04***	0.66		-11.56***		
z2	4.88***	0.68		6.46***		

All variables, including the yearly intercepts, are deflated by $SALE_{it}$. Thus, the $SALE_{it}$ variable in Eq. (3) becomes a unit vector, and its coefficient is a common intercept. Intercepts are not tabulated here for brevity. Variable definitions: P_{it} = market value of firm i 3 months after the end of year t ; with the effect of stock dividends and splits adjusted for; D_{it} = cash dividend in year t ; YR_{it} = a year dummy variable with 1 for the test year and 0 otherwise; BV_{it}^* = BV_{it} (book value of net assets at the end of year t) $- RDCAP_{it} + D_{it}$; $RDCAP_{it}$ = capitalized R&D; $SALE_{it}$ = net sales for firm i in year t ; $OEXP_{it}$ = all expenses (including cost of goods sold and income tax expenses) other than R&D expense, advertising expense, and extraordinary gains or losses in year t ; $RDEXPC_{it}$ = R&D expenditures expensed for full expensers in year t ; $RDEXPF_{it}$ = R&D expenditures expensed for capitalizers in year t ; and $ADEXP_{it}$ = advertising expenses.

Extreme values are eliminated if the absolute value of RSTUDENT is greater than three or the absolute value of DEFTS is greater than $3(pn)^{1/3}$, where p and n are the number of parameters and observations, respectively (Belsley et al., 1980). Regression results are based on 3099 firm years, after eliminating extreme values.

z1 and z2 statistics test the significance each coefficient across years against the null, that the coefficient equals 0 (Aboody and Lev, 1998).

*Significant at .05 (two-tailed).

**Significant at .01 (two-tailed).

***Significant at .001 (two-tailed).

expense occurs, unlike other expenses. H_{3s} , which hypothesizes that the coefficient on $RDEXPC_{it}$ is greater than the coefficient on BV_{it}^* , is a stronger test of the perceived future benefits of expensed R&D. This hypothesis is not supported; however, the t statistic is not significant. The evidence that R&D expense from partial capitalizers may represent future economic benefits as assets is thus somewhat weak. Panel B also shows that although the difference between the coefficients on $ADEXP_{it}$ and $OEXP_{it}$ is significant, the sign of the difference is incorrect. The coefficients on both variables are significantly less than 0 (both P values < 0.001) in Panel A. Thus, these results do not support either H_4 or H_{4s} , and are consistent with a belief by market participants that advertising expenditures do not represent future economic benefits, and thus expensing is warranted.

Our last two hypotheses, H_5 and H_6 , hypothesize that the coefficient on $RDCAP_{it}$ exceeds the coefficients on $RDEXPF_{it}$ and $RDEXPC_{it}$, respectively. The Korean GAAP prohibits capitalization of R&D expenditures unless future economic benefits are reasonably expected; thus, the value-relevance of capitalized R&D is predicted to be greater than that of expensed R&D. t Statistics at the bottom of Panel B of Table 4 are significant for both tests of coefficient differences, providing support for both hypotheses ($P < .01$ and $P < .001$, respectively).¹⁴

Table 5 presents results from the yearly estimation of Eq. (3). White's t statistics are given for each yearly coefficient estimate, as well as $z1$ and $z2$ statistics (Aboody and Lev, 1998) to test coefficient significance across years.¹⁵ The means of the yearly coefficients in Panel A of Table 5 are close to the pooled estimates reported in Panel A of Table 4, except for the coefficient on $RDEXPC_{it}$; however, the coefficient on this variable is not significant in the pooled regression, or in tests ($z1$ and $z2$ statistics) based on the yearly models. The yearly coefficient estimates on BV_{it}^* , $RDCAP_{it}$, and $OEXP_{it}$ are significant in most years. While yearly coefficient estimates on $ADEXP_{it}$ and $RDEXPF_{it}$ are significant in 4 of 11 years and 1 of 11 years, respectively, the $z1$ and $z2$ statistics for these variables indicate strong significance across the 11 sample years ($P < .001$). The mean yearly coefficient difference estimates in Panel B of Table 5 are essentially the same as the pooled difference estimates reported in Panel B of Table 4.

In summary, the results in Tables 4 and 5 suggest the following. First, capitalized R&D expenditures appear to be not only priced positively but also valued more highly than other assets, and thus appear to be regarded by market participants as positive net present-value investments. Second, market participants appear to interpret expensed R&D expenditures as positive net present-value investments also, in cases where firms entirely expense their

¹⁴ It could be argued that our sample may be affected by a self-selection bias, because Korean firms have substantial discretion over whether they capitalize R&D. When we added the Capitalization-Intensity variable (CPRATIO, as defined in Table 2) to Eq. (3) as an independent variable to control for the self-selection bias, its coefficient was not significant, and the significance of the other explanatory variables was basically the same. Further tests reveal that CPRATIO is largely explained by $RDCAP$, $RDEXP$, $SALE$, and $OEXP$, so adding this variable to Eq. (3) is redundant. These data are available from the authors upon request.

¹⁵ The $z1$ statistic is $(1/T^{1/2}) \sum_{j=1}^T (t_j / (k - (k - 2)^{1/2}))$, where t_j is the t statistic for year j , k is the degrees of freedom, and T is the number of years. The $z2$ statistic is [the mean t statistic (standard deviation of t statistics $(T - 1)^{1/2}$)], where T is the number of years. $z1$ statistics assume residual independence, whereas $z2$ statistics account for cross-sectional and temporal residual correlations (Aboody & Lev, 1998; Barth, Clement, Foster, & Kaznik, 1998; White, 1980).

R&D expenditures. Third, the portion of R&D expenditures that is expensed by firms that partly capitalize R&D expenditures is priced significantly less negatively than other expenses. While this result suggests that these R&D expenses exhibit future economic benefits, the perceived benefits are not so great as to argue in favor of capitalization; alternatively, this result could also indicate a market preference for the more conservative treatment of expensing. Under Korean GAAP, firms may capitalize R&D expenditures when future economic benefits are reasonably expected. Firms in Korea may thus exercise discretion over the capitalization of R&D; however, the market seems to value capitalized R&D greater than net book value, although fully expensed R&D expenditures are also priced positively.¹⁶ Fourth, as with other expenses, advertising expenditures are not believed by market participants to represent future economic benefits.¹⁷

5. Summary and conclusions

This study investigates the value-relevance of R&D disclosures reported by firms listed on the Korean Stock Exchange from 1988 to 1998. Korean GAAP allows the capitalization of R&D expenditures when future economic benefits are reasonably expected from the expenditures. Using tests conducted with regression models derived under Ohlson's (1995) equity-valuation framework, we find that R&D expenditures are, in general, positively associated with stock price. Capitalized R&D expenditures appear to be regarded by market participants as a positive net present-value investment. Assuming capital-market efficiency, this suggests that investors generally agree that capitalizing rather than expensing these R&D expenditures is appropriate.

Fully expensed R&D expenditures, although priced less than capitalized R&D, are also found to be regarded by market participants as a positive net present-value investment. This may signify that at least a portion of R&D expenditures merits capitalization, even when these expenditures are fully expensed. Although R&D expenses of firms that partially capitalize R&D expenditures were found to have no significant price impact, the regression coefficient on these expenditures is significantly less negative than the coefficient on other expenses. This may indicate a market belief that these expenditures

¹⁶ Ayers (1986), Bowen, Noreen, and Lacey (1981), Daley and Vigeland (1983), DeFond and Jambalvo (1991), Dhaliwal (1980), Dhaliwal, Salamon, and Smith (1982), Duke and Hunt (1990), Lilen and Pastena (1982), Press and Weintrop (1990), Zimmer (1986), and Zmijewski and Hagerman (1981) note that the debt-to-equity (d/e) ratio proxies for closeness to binding debt covenants. Results of additional tests (not presented) indicate that the proportion of R&D expenditures capitalized is greater among firms with higher d/e ratios and lower earnings, consistent with earnings management by these firms. These results are available from the authors.

¹⁷ We also tested the sensitivity of our results to macroeconomic condition (annual real GDP growth rates obtained from the Bank of Korea economic database), firm size (year-end market value of equity), and firm technology level (based on the standard industry code of Korea). The sample was partitioned into two groups on each of these dimensions. Eq. (3) was estimated separately for the two groups, and results were compared. In each case, our results were not differentiated by the conditioning variable, and the order of magnitude on our coefficient estimates remained the same (i.e., $RDCAP > RDEXPF > RDEXPC$). Furthermore, the coefficient on $ADEXP$ was more negative than that on $OEXP$ in every comparison. We thus feel that it is unlikely that macroeconomic condition, size, or technology level is behind our results.

have some future economic benefit, but may also signify a market preference for the conservative treatment of expensing these expenditures, rather than capitalizing. Finally, advertising expenditures are found to be negatively associated with stock price, similar to the association between price and other expenses. This finding indicates that advertising expenditures, like other expenses, are not believed to represent future economic benefits.

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Big Six auditors and audit quality: The Korean evidence

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Abstract

This study investigates the association between discretionary accruals and Big Six and non-Big Six auditors, and the direction of auditor change. We hypothesize that there is no significant difference in discretionary accruals between Big Six and non-Big Six clients when there is low incentive for auditors to provide high-quality audits, as in Korea.

Upon examination of the discretionary accruals of firms listed on the Korean Stock Exchange from 1994 to 1998, we find there is no significant difference between the discretionary accruals of firms with Big Six and non-Big Six auditors. This holds true for firms that switch from non-Big Six to Big Six auditors and vice versa. These resources imply that there may be no difference in audit quality between Big Six and non-Big Six auditors in Korea. This is consistent with other studies in Korea, while inconsistent with the findings of previous studies on audit quality in other countries.

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Keywords: Audit quality; Big Six auditor; Discretionary accruals

1. Introduction

In this study, we examine whether Big Six auditors (before shrinking to four) provide higher quality audits than non-Big Six auditors in Korea where the institutional setting does not motivate auditors to provide high-quality audits. Specifically, we compare the discretionary accruals of firms audited by Big Six auditors with those of firms audited by non-Big Six auditors, as well as the discretionary accruals of firms that change from Big Six to non-Big Six auditors and vice versa, using Korean data. We also investigate whether discretionary accruals increase (decrease) under the same conditions.

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Previous literature suggests that Big Six auditors are more likely to object to management's accounting choices that increase earnings if auditors are likely to be sued when financial statements overstate earnings (Becker, De Fond, Jambalvo, & Subramanyam, 1998; Francis, Maydew, & Sparks, 1999). These findings, however, are based on data from countries where auditors face high litigation risk when they provide low-quality audits. However, when there is little risk of litigation and no other effective disciplinary mechanism to control opportunistic behavior, auditors may choose not to provide high-quality audits. Until recently, suing auditors has been very rare in Korea and there is no other effective monitoring mechanism to prevent auditors' opportunistic behavior. In addition, since the auditors selected by a firm typically have personal ties to management, they may not bring a high level of independence to their auditing. Independent audits by external auditors are not necessary to obtain capital in Korea, and managers frequently regard audit fees and the filing of audited financial statements with regulatory bodies in Korea as unnecessary costs of doing business (Park, 1990). In such an institutional setting, where the auditor's incentive to provide high-quality audits is low, it is unlikely that Big Six auditors would have much incentive to restrict their clients' adoption of aggressive accounting methods.

In this study we conduct empirical analysis on a sample of 2117 firm-year observations over the period from 1994 to 1998. Discretionary accruals are obtained by using a cross-sectional variation of the modified Jones model. The evidence suggests that there is no statistically significant difference between the discretionary accruals of firms audited by Big Six and non-Big Six auditors, or of firms that change from one to the other. We interpret these results to mean that there may be no difference in audit quality between Big Six and non-Big Six auditors in Korea. While these findings are consistent with the results of other studies in Korea (e.g., Jeong, 1999; Jeong & Rho, 1999; Park, Jongil, & Won, 1999), they are inconsistent with the findings of many previous studies on audit quality in other countries (e.g., DeAngelo, 1981; Palmrose, 1988; Becker et al., 1998). Therefore, we need to examine whether auditor type can be used as a proxy for audit quality in research on earnings management in different countries and, if so, under what circumstances.

The remainder of the paper is organized as follows. In the next section we describe the institutional setting in the Korean audit market and the motivation for our hypothesis. The sample-selection procedure is discussed in Section 3. In Section 4 we explain variable measurement and our research methodology. Results are presented in Section 5, and the summary and conclusion are presented in Section 6.

2. Motivation, the Korean audit market, and hypothesis

Previous studies document that Big Six auditors charge higher audit fees, spend more time on audits, and have fewer lawsuits than non-Big Six auditors, which is taken to imply that Big Six auditors provide higher quality audits than non-Big Six auditors (DeAngelo, 1981; Francis & Simon, 1987; Palmrose, 1988, 1989). Furthermore, Becker et al. (1998) and Francis et al. (1999) find that clients of Big Six auditors report low discretionary accruals compared to clients of non-Big Six auditors, even though clients of Big Six auditors have high levels of total accruals. They argue that Big Six auditors have a greater

ability to constrain their clients' use of aggressive and questionable accounting methods and practices, thus increasing the quality of reported earnings for high-accrual firms. Big Six auditors have better methods for detecting problem areas, interpret GAAP conservatively (thereby reducing the scope for aggressive accruals-based earnings management), and can take a strong negotiating stance with clients who require more adjustments to the financial statements. Therefore, the fact that firms' financial statements are audited by Big Six auditors may indicate that earnings are subjected to less opportunistic earnings management.

However, if the economic environment and institutional setting does not demand high-quality audit services, auditors may not restrict the opportunistic behavior of management but rather may behave opportunistically themselves to attract more clients. Under the Acts on External Audits of Corporations in Korea, firms with total assets over a certain amount should report financial statements audited by external independent auditors. Annually, about 7000 firms, including 700 listed firms, issue audited financial statement under this law. However, since many firms in Korea raise more capital through debt financing than equity financing, managers do not appreciate the role and importance of external audits. Rather, they consider audit fees and audited financial statements filings as an unnecessary but unavoidable cost of doing business (Park, 1990). In addition, Korean business has traditionally operated on personal relationships such as family ties, school ties, or regional ties (Kim, Chung-Ki, & Cheong, 2002). In a relationship-based economy, auditors who are frequently selected on the basis of personal ties to the manager are less likely to constrain managers' opportunistic behavior. The fact that audit contracts are renewed every year places auditors in a weak bargaining position. For all these reasons, auditors in Korea are less likely to restrict managers from adopting aggressive accounting policies compared to auditors in other developed countries such as the United States.

In Korea there are two potential risks for auditors who provide low-quality audits: a penalty imposed by the government agency that reviews audit works and the possibility of litigation by a third party. Under the Acts on External Audits of Corporations, the government agency monitors the quality of audits on a sample basis. It reviews about 150 firms annually, less than 2% of all audits done in a year. In this environment, auditors may not believe they have a high likelihood of getting caught if they provide low-quality audits. Moreover, even when they are caught by the government agency the penalties are not severe enough to cause auditors to provide high-quality audits. Infractions for which auditors are penalized include not keeping generally accepted Korean auditing standards or irregularities in a firm's financial statements. The penalties that can be imposed on CPAs and their firms range from fines, reprimands, suspension of audit works for a certain period of time, revoking licenses, or a combination of these. In reality, most penalties on auditors are light—small fine, reprimands, or the suspension of audits for participating CPAs for a limited period. In most cases, these penalties have not been harsh enough to encourage auditors to change their behavior. In fact, the economic incentives would encourage them to attract more clients and make more revenues than what they pay in penalties by providing low- rather than high-quality audits. There has also been a very low risk of litigation during the period. The first litigation against auditors occurred in 1991, and during the 1990s there have been only 22 such lawsuits. During the same period, more

than 60,000 firm-year external audits, including 6000 listed firm-year audits, have been performed. In addition, the penalties against auditors by the court have been very small.¹

Auditor-selection mechanisms that foster independent external audits did not exist in Korea during most of the sample period. Auditor-selection committees, consisting of interested parties, such as internal auditors, outside directors, who are typically the second largest shareholders, and the largest debtors except the largest shareholders and related parties, were introduced in 1997 and have been effective since 1998; audit committees were introduced for listed firms in 2001. (Only one year, therefore, overlaps with our sample period.) Therefore, we consider socioeconomic and institutional environment in Korea to provide a generally weak incentive for performing high-quality audits during the sample period.

Big Six auditors in Korea do adopt standardized audit technology, whereas non-Big Six auditors use their own audit technology, even when they are associated with other international auditing firms such as Grant Thornton, BDO Seidman, and so forth. Even when the institutional environment provides a low incentive for performing high-quality audits, Big Six auditors may provide high-quality audits because they apply their standardized global audit technology for all audits and thus deliver the same audit quality in Korea as in other countries. This is highly probable if Big Six auditors can monitor the audits of their branches in Korea. However, Big Six auditors do not have mechanisms for monitoring different local audit reports written in Korean than non-Big Six auditors. They go through an internal review process to check for global audit quality standards only when the audit reports are written in English by technical advisors from the Big Six headquarters. All the audit reports required by the Security Exchange Acts and the Acts on External Audits on Corporations in Korea are, however, provided in Korean and these are the accounting numbers most investors in the Korean stock market use for decision making. Audit reports written in English are not usually available to investors in Korea unless firms are cross-listed on international exchanges. During the sample period, there are very few cross-listed firms. Audit quality between Big Six auditors and non-Big Six auditors in Korea may, therefore, not be different.

Previous studies in audit quality in Korea provide results consistent with this conjecture. Audit quality has been proxied by many variables: audit fees, audit hours, litigation rate, or discretionary accruals, for example. As suggested in previous studies in the United States, Big Six auditors who provide high-quality audits will charge a premium fee for their services. Empirical research using Korean data, however, show different results. Choi and Paek (1998) examine whether Big Six auditors actually charge higher fees and spend more time on audits than non-Big Six auditors. They document that there is no difference in audit fees between Big Six and non-Big Six, but that Big Six auditors spend more time on their audits. This suggests that Big Six auditors are not recognized as providing a higher quality service than non-Big auditors.

Because litigations against auditors are very rare in Korea, researchers use the detection ratio in audit reviews by the government agency as a proxy for audit quality. As noted

¹ The largest penalty against auditors totals less than \$100,000 during this period. Therefore, auditors rarely settle the case outside the court.

above, a Korean government agency reviews only a small sample—the audits of about 150 firms—annually and penalizes auditors when wrongdoings are uncovered. It follows that if Big Six auditors provide higher quality audits, they should be detected and penalized less often than non-Big Six auditors. However, Jeong (1999) examines the agency audit-review results and finds no significant difference between Big Six and non-Big Six auditors. Jeong and Rho (1999) and Kim and Hwang (1998) examine prior-year adjustments to measure the differences between Big Six and non-Big Six auditors. If auditors find accounting irregularities in previous financial statements, it is assumed that high-quality auditors are more likely to make corrections and report the changes in current financial statements. Kim and Hwang compare the number of prior year adjustments between clients of Big Six and non-Big Six auditors and find no significant difference between the two groups. Jeong and Rho examine the number of prior-year adjustments for firms that change auditors and find the same results as Kim and Hwang, while documenting an overall increase in the number of prior-year adjustments regardless of auditor type. Park et al. (1999) look into the audit-quality issue using discretionary accruals. They compare the discretionary accruals of Big Six and non-Big Six clients and find no difference between them (using only univariate tests). Their results are limited, however, because discretionary accruals could be affected by variables such as firm size, leverage, operating characteristics of firms, auditor change, and stock offering. We propose, therefore, to add to the evidence of audit quality in Korea by examining discretionary accruals after controlling for these variables.

In sum, previous studies suggest that audit quality in Korea may not differ between Big Six and non-Big Six auditors, whereas audit quality in other developed countries such as the United States does differ between Big Six and non-Big Six auditors. Because many previous studies in earnings manipulation in Korea show that managers manipulate accounting numbers in many cases,² it would be interesting to look into whether auditors play an appropriate monitoring role over the production of accounting information in Korea. Using discretionary accruals as an indicator of quality, the first hypothesis we examine is as follows.

H1. Given the institutional environment in Korea, firms with Big Six auditors are likely to report the same level of discretionary accruals as firms with non-Big Six auditors.

When firms change auditors, the new auditors may have stronger incentives to provide high-quality audits compared to the old auditors even if there is no effective market monitoring over audit quality. This is not usually due to the new auditors' attempt to show that the prior auditors were not competent, which is unusual in a relation-based economy. Rather, it is because the new auditors want to reduce the likelihood of being reviewed by the government agency and are penalized for accounting irregularities made in the prior year, even when there is not a high litigation risk. Jeong and Rho (1999) provide evidence consistent with this argument

² There are many indications that managers in Korean firms manipulate accounting numbers when a firm is in financial distress, offer seasoned equities, and want to smooth income, and so forth, similar to managers in other foreign firms. Yoon and Miller (2002a, 2002b) provide a good summary of recently published papers in this area.

by showing that prior year adjustments increase after an auditor change. Therefore, if Big Six auditors provide higher quality audits than non-Big Six auditors, they will be especially diligent when replacing a non-Big Six auditors. This leads us to assert that there should be a difference in discretionary accruals between firms that change to a Big Six auditor and those that change to non-Big Six, if Big Six and non-Big Six provide differential quality audits. That is, if firms change auditors from non-Big Six (Big Six) to Big Six (non-Big Six) auditors, the discretionary accruals of the firms are likely to decrease (increase). However, when there is no effective mechanism that enforces performing high-quality audits, auditors are likely to provide similar quality audit service and there will be no difference in discretionary accruals between Big Six and non-Big Six auditors and no change in the discretionary accruals after auditor change, regardless of auditor change direction. To address this issue we examine the following two hypotheses:

When there is low incentive for auditors to provide high-quality audits,

H2. Firms that switch from non-Big Six to Big Six auditors are likely to report the same discretionary accruals as the firms that switch from Big Six to non-Big Six auditors.

H3. Firms that switch from non-Big Six to Big Six auditors are not more likely to increase discretionary accruals than the firms that switch from Big Six to non-Big Six auditors.

3. Sample selection

To test the hypotheses we use two sets of samples. The first sample, which is used to examine the first hypothesis, consists of 2117 firm-year observations listed in the Korean Stock Market during the period 1994 to 1998. We exclude financial institutions from the sample because of the differences in estimation of discretionary accruals from firms in other industries. In addition, we use only December year-end firms. When there are fewer than 10 firms in an industry (two-digit SIC codes), for the estimation of nondiscretionary accruals, we eliminate them from the sample. We require that firms' financial data be available in the KIS-FAS database that contains financial statements of Korean listed companies since 1980. In addition, we require that firms receive an unqualified audit opinion because firms with a qualified opinion are likely to report more discretionary accruals. We include firms that receive an unqualified opinion with an explanatory paragraph in the sample. This sample-selection procedure yields 2117 firm-year observations of which 1311 firm-year observations are audited by Big Six auditors and 806 are audited by non-Big Six auditors.

The second sample, which is used to examine the second and third hypotheses, consists of firm-year observations that change auditors during the period 1995 to 1998, and meet all other sample-selection criteria used in the first sample-selection procedure. Two hundred eighty-nine firm-year observations are included in the second sample. We use the auditor-change sample for Hypotheses 2 and 3 because auditors have a strong incentive to provide high-quality services when they are changed. If the results in the change sample is not different from the first sample, there is a high likelihood that the quality of audit services provided by Big Six auditors is not

different from that provided by non-Big Six auditors. On average, 18% of listed firms change auditors each year, implying that one out of five or six firms change their auditor. Among these, 58% of the firms that change auditors are selected for our final sample. They represent 10.3% of all listed firms in Korea and are spread out across the sample period.

4. Research methodology and variable measurement

4.1. Estimation of discretionary accruals

Previous studies have used various methodologies to estimate the effects of accounting choices on reported earnings. Healy (1985) uses total accruals and McNichols and Wilson (1988) use the discretionary portion of an individual account, bad-debt provisions. However, Healy's model does not separate nondiscretionary accruals from discretionary accruals and McNichols and Wilson's method does not examine the behavior of total discretionary accruals. Therefore, to capture the net effect of all accounting choices on reported income, Jones (1991) uses an OLS model, regressing total accruals against the change in revenue and property, plant and equipment. Since then, many studies have adopted the Jones Model. Dechow, Sloan, and Sweeney (1995) modify the Jones (1991) estimation model by adding the change in accounts receivable as an additional explanatory variable in the estimation regression and report better performance of their model in estimating discretionary accruals. Furthermore, Subramanyam (1996) finds that the cross-sectional Jones models are generally better specified than their time-series counterparts. Therefore, we measure discretionary accruals by using the cross-sectional variation of the modified Jones model.³

Total accruals can be defined in various ways. Jones (1991) defines total accruals by subtracting operating cash flows from reported accounting earnings. Specifically, Jones defines accruals as follows:

$$TA_{it} = \Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + STD_{it} - DEP_{it} \quad (1)$$

where

TA_{it} = total accruals for firm i for year t ;

ΔCA_{it} = change in current assets for firm i for year t ;

ΔCL_{it} = change in current liability for firm i for year t ;

$\Delta Cash_{it}$ = change in cash for firm i for year t ;

STD_{it} = current portion of long-term liability for firm i for year t ;

DEP_{it} = depreciation expenses (including amortization of intangible and deferred assets) for firm i for year t .

³ We also estimate the original Jones model using the same definition of discretionary accruals, i.e., net income minus operating cash flows, as in Becker et al. (1998), and find the results are qualitatively similar to the results we report here.

When we define accruals as the difference between accounting earnings and operating cash flows, the accruals include gains or losses from investing and financing activities. However, most previous studies use a definition of accruals that does not include the gains or losses from investing and financing activities. This may be because COMPUSTAT does not contain the details of the gains or losses from investing and financing activities. If the data are available, we can explicitly differentiate accruals from gains and losses by dividing accounting earnings into operating cash flows, accruals, and gains and losses from investing and financing activities. Bae (1999) argues that separating accruals from gains and losses from investing and financing activities is a more accurate measurement and that the data required to measure accurate accruals are available in the Korean database, KIS-FAS. Therefore, we follow Bae's definition of accruals in this study to maintain comparability with other studies in Korea. He estimates accruals in a way very similar to Jones (1991) and other studies, while taking advantage of detailed data in the KIS-FAS database to calculate accruals. The definition of accruals used in this study is the following:

$OA_t = \text{trade receivables}_t (\text{short term and long term}) + \text{inventory}_t + \text{advance payments}_t (\text{short term and long term}) + \text{prepaid expenses}_t (\text{short term and long term}) + \text{accrued income}_t;$

$OL_t = \text{trade payables}_t (\text{short term and long term}) + \text{advance from customers}_t (\text{short term and long term}) + \text{accrued expenses}_t (\text{short term and long term}) + \text{accrued income taxes}_t + \text{unearned income}_t;$

$NCA_t \equiv \text{noncurrent accruals}_t = \text{depreciation (including special depreciation)}^4 + \text{amortization of intangible assets}_t + \text{amortization of deferred assets}_t (\text{excluding stock issuance cost and debenture issuance cost}) + \text{severance benefits expenses}_t;$

$\Delta OA_t = OA_t - OA_{t-1};$

$\Delta OL_t = OL_t - OL_{t-1};$

$CA_t \equiv \text{current accruals} = \Delta OA_t - \Delta OL_t;$

$TA_t = \text{total accruals} = \text{current accruals} + \text{noncurrent accruals} = CA_t - NCA_t.$

Using the estimated coefficients of the modified Jones model, we calculated discretionary accruals as follows:

$$e_{it} = TA_{ijt} / A_{ijt-1} - (a_{jt}[1/A_{ijt-1}] + b_{1jt}[(\Delta REV_{ijt} - \Delta REC_{ijt})/A_{ijt-1}] + b_{2jt}[PPE_{ijt}/A_{ijt-1}]) \quad (2)$$

where

a_{jt} , b_{1jt} , and b_{2jt} are the estimated coefficients of the modified Jones model;

TA_{ijt} = total accruals for firm i in industry j for year t ;

A_{ijt-1} = total assets for firm i in industry j for year $t-1$;

⁴ In Korea, firms can depreciate tangible assets more than the amount normally calculated by the straight-line method, accelerated method, and production method when they meet certain conditions in tax law and this accounting treatment is permitted for financial reporting also.

ΔREV_{ijt} = change in net revenues for firm i in industry j for year t ;

ΔREC_{ijt} = change in accounts receivable for firm i in industry j for year t ;

PPE_{ijt} = gross property plant and equipment for sample firm i in industry j for year t .

Discretionary accruals are usually estimated by using time-series data of the same firm or cross-sectional data of the industry that the sample firm belongs to. We adopt the cross-sectional version of the discretionary-estimation model using two-digit SIC codes. If we use a time-series model in estimating the modified Jones model, we would require that sample firms not change their auditors during the estimation period, usually 8 to 10 years. If firms change their auditors during the estimation period, there might be a change in the parameter of the estimation model due to the auditor change. Most Korean firms change their auditors over a period of 8 years. On average, 17% to 20% of firms change auditors in a given year. Therefore, we use cross-sectional industry data to estimate discretionary accruals. For the estimation of discretionary accruals for our sample, we require that there be at least 10 firms within the industry. The average explanatory power of the modified Jones model, i.e., the average of adjusted R^2 over years, is about 16.1%. Bae (1999) shows that the adjusted R^2 s of several discretionary-accruals models using Korean data range between 12% and 17%. This shows that our sample is similar to the samples in other studies that use Korean data.

4.2. Multivariate test model and control variables

Because the comparison of discretionary accruals between firms with Big Six auditors and non-Big Six auditors is the main focus of our analysis, we conduct univariate tests as well as multivariate tests. In the multivariate test we control for potential differences across the firms that may affect the results of simple univariate tests. We regress discretionary accruals estimated in Eq. (2) on a dummy variable indicating auditor type and several control variables. Specifically, we run the following multivariate regressions to test the first hypothesis.

$$DA_{it} = \beta_0 + \beta_1 \text{Big}_{it} + \beta_2 \text{OCF}_{it} + \beta_3 \text{Size}_{it} + \beta_4 \text{HiLev}_{it} + \beta_5 \text{Abs_acc}_{it} \\ + \beta_6 \text{ShareInc}_{it} + \beta_7 \text{Change}_{it} + \beta_8 \text{Ownship}_{it} + e_{it} \quad (3)$$

where

DA_{it} = estimated discretionary accruals;

Big_{it} = auditor type dummy variable equal to one if the auditor is Big Six;

OCF_{it} = operating cash flows;

Size_{it} = natural logarithm of total assets;

HiLev_{it} = dummy variable indicating whether firms are among the highest decile unclear of leverage, by year and industry;

Abs_acc_{it} = the absolute value of total accruals;

ShareInc_{it} = dummy variable equal to one when there is an increase of more than 10% of the total outstanding shares during the year;

Change_{*it*} = dummy variable equal to one when there is an auditor change;

Ownship_{*it*} = percentage of ownership by the largest shareholders including related parties.

In this study, we expect no significant coefficient on auditor-type dummy variable (Big). To control for other relevant variables that affect discretionary accruals, we include operating cash flows, total assets, leverage, the absolute value of total accruals, increase in the number of shares outstanding, equity ownership by largest shareholders in the regression. A variable to control for the effect of management compensation is not included in the regression, even though previous literature suggests that the management compensation contract is related to discretionary accruals. Management compensation based on accounting earnings is not common in Korea.

Dechow et al. (1995) show that operating cash flows are negatively correlated with the level of accruals. We expect a negative coefficient on operating cash flows. We use the natural logarithm of total assets as a size variable to control for the political effect on discretionary accruals and also as a surrogate for numerous omitted variables. Firms that have a high chance of receiving political attention are more likely to manipulate accounting numbers to avoid political scrutiny. During the sample period, most firms in Korea pursue growth in size rather than profitability. Large firms, therefore, tend to show lower profitability than small firms. However, if a large firm reports very low profitability, it is more likely to get attention because of its size. During the sample period, large firms reported lower profitability, and Jeong (1999) provides the evidence that large firms are more likely to be involved in accounting manipulation than small firms. We, therefore, expect a positive coefficient for the size variable.

To control for the possible effect of leverage, we include a dummy variable (HiLev), which takes one when firms have the highest decile leverage in the same industry during the year of interest in the multiple regression as in Becker et al. (1998). Press and Weintrop (1990) find that firms with high leverage are more likely to be close to the violation of debt covenants. DeFond and Jiambalvo (1994) show that debt-covenant violation is associated with discretionary-accruals choice. Managers of firms with high leverage are more likely to adopt income-increasing accounting methods. However, firms with high leverage are more likely to be in financial distress (Beneish & Press, 1995). DeAngelo, DeAngelo, and Skinner (1994) show that troubled companies have large negative accruals related to contractual renegotiations that provide incentives to reduce earnings. Therefore, we do not have prior expectation on this variable.

Francis et al. (1999) argue that firms with greater endogenous accruals-generating potential have greater uncertainty about reported earnings because of the difficulty that outsiders have in distinguishing discretionary and nondiscretionary accruals. If we do not have an accurate mechanism for differentiating discretionary accruals from nondiscretionary accruals, it is likely that firms with the larger absolute value of total accruals will show higher discretionary accruals. To control this effect we include the absolute value of total accruals as a control variable in the regression as in Becker et al. (1998). We expect a positive coefficient on this variable.

Teoh, Welch, and Wong (1998) find that managers report higher earnings when they issue seasoned equities by adjusting current discretionary accruals. Beneish (1997) also

argues that managers will manipulate earnings upward due to incentives associated with selling their personal holdings as part of and subsequent to equity offerings. Therefore, we include a dummy variable that indicates whether the number of outstanding shares has increased by 10% or more.⁵ We expect a positive coefficient on this variable.

An auditor-change dummy variable is also included in the regression because new auditors tend to attribute previous accounting irregularities on previous auditors. Jeong and Rho (1999) and Kim and Hwang (1998) find that the number of prior year adjustments increases after firms change their auditors regardless of auditor change direction. We expect a positive coefficient on the auditor-change variable.

Klassen (1997) argues that closely held firms can inform shareholders of firm value more efficiently than widely held firms through communication channels other than audited financial statements and press releases. As a result, these firms face less pressure from capital markets. Firms with less capital-market pressure have less incentive to provide useful accounting information to decision makers. This implies that firms with higher inside ownership may have more flexibility in financial reporting than firms with lower inside ownership. Thus, we include an ownership variable in the regression to control for the effect of inside ownership on reported earnings and discretionary accruals. Inside ownership is defined as the percentage of shares held by management. A positive coefficient is expected on this variable.

To compare discretionary accruals between Big Six and non-Big Six auditors using auditor-change firms, we divide second sample firms into groups depending on the direction of auditor change. When firms change from Big Six to non-Big Six auditors, we put them into the BN change group; when firms change from non-Big Six to Big Six auditors, we put them into the NB change group. While previous studies imply the firms in the BN change group are likely to report more discretionary accruals than firms in the NB change group, we expect no difference as explained in the previous section. For these groups of firms, we first examine whether there is a difference in discretionary accruals and change in discretionary accruals without controlling for other variables. Then we control for other variables that may explain the difference in discretionary accruals across sample groups to check whether our experimental variable explains discretionary accruals after controlling for these variables. Specifically, we run the following multivariate regressions to test the second and third hypotheses.

$$\begin{aligned} DA_{it}(\text{or } \Delta DA_{it}) = & \beta_0 + \beta_1 \text{NB-change}_{it} + \beta_2 \text{BN-change}_{it} + \beta_3 \text{OCF}_{it} + \beta_4 \text{Size}_{it} \\ & + \beta_5 \text{HiLev}_{it} + \beta_6 \text{Abs_acc}_{it} + \beta_7 \text{ShareInc}_{it} + \beta_8 \text{Ownship}_{it} + e_{it} \end{aligned} \quad (4)$$

where

DA_{it} = estimated discretionary accruals;

ΔDA_{it} = change in discretionary accruals;

⁵ We did not include a dummy variable for a decrease in the outstanding shares because stock repurchase was not allowed during the sample period.

NB-change_{*it*} = auditor-change dummy variable, when firms change their auditors from non-Big Six auditors to Big Six auditors assign one, zero otherwise;

BN-change_{*it*} = auditor-change dummy variable, when firms change their auditors from Big Six auditors to non-Big Six auditors assign one, zero otherwise;

Other variables are the same as in Eq. (3).

In this study, we expect no significant coefficients on either variable, while previous studies imply that the coefficients on NB-change and BN-change are significantly negative and positive, respectively.

5. Empirical results

5.1. Descriptive statistics and univariate results

Table 1 shows the descriptive statistics of variables used in the analysis. Operating cash flows are about 2% of total assets. The median of assets are 156 billion Korean won. Leverage is about 68% of total assets, which is 15% higher than that of U.S. firms used in Becker et al. (1998). This implies that Korean firms have 100% higher debt ratio than U.S. firms.⁶ Total accruals are higher than that of U.S. firms while the absolute value of total accruals are smaller than that of US firms.

Size and ownership are significantly different between firms with Big Six and non-Big Six auditors both on the parametric and nonparametric tests. Leverage and total accruals are significantly different across the groups on the nonparametric tests. The mean and median absolute values of total accruals scaled by assets are not statistically different between firms with Big Six and non-Big Six auditors. Therefore, in addition to univariate tests, we need multivariate tests that control other variables affecting discretionary accruals before drawing any conclusions.

The univariate-analysis results of discretionary accruals of pooled observations over years are presented in Table 2. Table 2 shows mean and median discretionary accruals and the absolute value of discretionary accruals for firms with Big Six and non-Big Six auditors. The differences obtained from subtracting the means and medians of non-Big Six samples from those of Big Six samples are reported in the last two columns along with the results of *t* tests and Wilcoxon two-sample tests of the differences between the two samples. As Table 2 shows, there is no statistical difference in discretionary accruals, while the mean and median of firms with non-Big Six auditors are slightly larger than those of firms with Big Six auditors. We also compare the absolute value of discretionary accruals because the larger they are the more likely managers may exercise discretion in reporting earnings. The mean and median values of the absolute value of discretionary accruals are almost the same for the two groups and not statistically different. Along with the results of discretionary accruals, these findings also show that

⁶ Average debt equity ratio for Korean firms is 213% [$-68 \div (1 - 68)$], and average debt equity ratio for U.S. firms is 113% [$= 53 \div (1 - 53)$].

Table 1
Descriptive statistics of variables for sample firms ($N=2117$)

Panel A					
	Mean	S.D.	Maximum	Median	Minimum
OCF	0.0238	0.0935	0.4370	0.0237	−1.0061
Size	19.08	1.343	24.01	18.87	16.07
Lev	0.6774	0.2295	4.4659	0.6775	0.1096
Tot_acc	−0.0226	0.0855	0.3970	−0.0223	−0.8752
Abs_acc	0.0637	0.0614	0.8752	0.0487	0.0001
Ownship	26.80	13.92	97.60	25.50	0.80

Panel B						
	Non-Big Six ($N=806$)		Big Six ($N=1311$)		Differences	
	Mean	Median	Mean	Median	<i>t</i> statistic	Z statistic
OCF	0.0204	0.0204	0.0258	0.0263	−1.27	−1.50
Size	18.87	18.71	19.21	19.00	−6.09***	−4.10***
Lev	0.6709	0.6639	0.6814	0.6901	−1.03	−3.29***
Tot_acc	−0.0197	−0.0167	−0.0244	0.0240	1.22	1.90*
Abs_acc	0.0636	0.518	0.0637	0.0469	−0.03	1.54
Ownship	27.47	26.20	26.39	25.00	1.77*	1.68*

OCF = operating cash flows divided by total assets; Size = log transformed total assets, which are measured in thousand won; Lev = total liabilities divided by total assets; Tot_acc = total accruals divided by total assets; Abs_acc = absolute value of total accruals; Ownship = the equity ownership percentage of the largest shareholder.

* Significant at 10% level.

*** Significant at 1% level.

the type of auditor make no difference to a manager's accounting flexibility of discretionary accruals.

To test whether there is a difference in the level of discretionary accruals depending on the direction of auditor change we run the ANOVA. Table 3 presents the results of the ANOVA test. It shows that discretionary accruals and the change in discretionary accruals among auditor change groups are not significantly different when we use all sample firms. In Korea, the Security and Future Committee (SFC)

Table 2
Comparison of discretionary accruals and absolute value of discretionary accruals between firms with Big Six and non-Big Six auditors during 1994–1998

	Non-Big Six ($N=806$)		Big Six ($N=1311$)		Differences	
	Mean	Median	Mean	Median	Mean	Median
Discretionary accruals	0.0078	0.0107	0.0062	0.0040	0.0016	0.0045
(<i>P</i> value)	(.000)	(.000)	(.003)	(.031)	(.621)	(.124)
Absolute value of	0.0535	0.0409	0.0535	0.0395	0.0000	0.0014
discretionary accruals						
(<i>P</i> value)	(.000)	(.000)	(.000)	(.000)	(.967)	(.708)

Discretionary accruals are measured by the cross-sectional version of the modified Jones model by industry and year.

Table 3
ANOVA analysis of auditor change direction and discretionary accruals

	Designated-change firms				Free-change firms				All			
	DA		Δ DA		DA		Δ DA		DA		Δ DA	
	Mean (S.D.)	N	Mean (S.D.)	N	Mean (S.D.)	N	Mean (S.D.)	N	Mean (S.D.)	N	Mean (S.D.)	N
Big 6 → Big 6	0.0045 (0.108)	59 (42.4)	−0.0017 (0.175)	58 (43.0)	−0.0026 (0.113)	36 (24.0)	0.0378 (0.209)	35 (24.7)	0.0005 (0.123)	95 (32.9)	0.0132 (0.188)	93 (33.6)
Non-Big 6 → Big 6	0.0231 (0.145)	23 (16.6)	−0.0209 (0.147)	22 (16.3)	0.0211 (0.117)	33 (22.0)	0.0017 (0.161)	33 (23.2)	0.0073 (0.114)	56 (19.4)	−0.0074 (0.155)	55 (19.8)
Big 6 → Non-Big 6	0.0350 (0.150)	42 (30.2)	0.0370 (0.163)	41 (30.3)	−0.0193 (0.170)	45 (30.0)	0.0119 (0.186)	41 (28.9)	−0.0023 (0.185)	87 (30.1)	0.0245 (0.174)	82 (29.6)
Non-Big 6 → Non-Big 6	−0.0315 (0.130)	15 (10.8)	−0.0551 (0.142)	14 (10.4)	0.0274 (0.154)	36 (24.0)	0.0213 (0.222)	33 (23.2)	−0.0035 (0.160)	51 (17.6)	−0.0014 (0.203)	47 (17.0)
All	0.0053 (0.131)	139 (100.0)	0.0014 (0.165)	135 (100.0)	0.0048 (0.143)	150 (100.0)	0.0181 (0.194)	142 (100.0)	0.0058 (0.149)	289 (100.0)	0.0099 (0.180)	277 (100.0)
F value	1.486		1.340		0.899		0.213		1.372		1.340	

DA = the discretionary accruals estimated by the modified Jones model and scaled by previous-year total assets.

Δ DA = the change in discretionary accruals estimated by the modified Jones model and scaled by previous-year total assets.

has the power to order an auditor change if a firm does not meet the conditions that the SFC requires.⁷ In this case, firms might have different discretion in choosing accounting methods from firms that change auditors by their own intention. Therefore, we separate the sample firms into two groups to determine whether the cause of auditor change affects the results of our analysis. There are 129 firm-year observations that change auditors by their own decision (free-change firms) and 125 firm-year observations that change auditors by the designation of the SFC (designated-change firms). Whether we use designated-change firms or free-change firms, discretionary accruals and the change in discretionary accruals among auditor groups are not significantly different.

5.2. *Multivariate analysis*

Because we ignore a number of variables that affect discretionary accruals, we run the multivariate regression with the control variables discussed in Section 4. Table 4 shows the results of the estimation of regression equation (3) for the test of Hypothesis 1. The first two columns show the results of pooled regressions and the last column shows the results of yearly regressions. The coefficients on the first variable (Big), indicating whether firms are audited by Big Six auditors, is not significant at all in any of the three regressions. This is consistent with our expectation and the results of univariate tests. It suggests the possibility that Big Six auditors in Korea do not provide higher quality audits than non-Big Six auditors.

Most of the control variables in the multivariate regression are significantly related to discretionary accruals with expected signs. Operating cash flows are strongly negatively associated with discretionary accruals, which is consistent with the results of Becker et al. (1998) and Dechow et al. (1995). The magnitude of the coefficient on operating cash flows in this study is much larger than that of Becker et al. This may be due to using Korean data. Most of Korean accounting standards required by the SFC in financial reporting are based on the abstracts of the U.S. GAAP minus the specific details, thereby allowing managers more flexibility in reporting. Thus, it is easier to manipulate earnings in Korea than in other countries such as the United States. Because discretionary accruals are not related to cash flows, when there are more discretionary accruals in earnings, the coefficient on operating cash flows is more likely to be negative. In addition, some of the negative coefficient value may be caused by the number of nondiscretionary accruals treated as discretionary accruals due to a classification error in the modified Jones model. Nondiscretionary accruals may have a negative relation with cash flows from operation due to the definition of total accruals. The positive coefficient on the size variable implies that large firms are more inclined to income-increasing accounting policy. This is consistent with results (Jeong, 1999) that firm size is significantly related to the possibility of being detected for accounting irregularities in the audit-review process by the government agency.

⁷ The role of the SFC in Korea is similar to that of SEC in the United States in regulating firms' disclosure.

Table 4

Regression results of discretionary accruals on auditor type and control variables, 1994–1998 period

	Pooled		Average estimate of 5 yearly regressions (<i>t</i> statistic) ^a
	1994–1998 (<i>t</i> statistic)	1994–1997 (<i>t</i> statistic)	
Intercept	–0.0558 (–2.70)***	–0.0495 (–2.33)**	–0.0315 (–0.92)
Big	–0.0010 (–0.34)	–0.0022 (–0.76)	–0.0017 (–0.71)
OCF	–0.3613 (–23.36)***	–0.3958 (–22.74)***	–0.3748 (–12.59)***
Size	0.0040 (3.81)***	0.0035 (3.25)***	0.0031 (1.81)*
HiLev	–0.0387 (–7.65)***	–0.0336 (–6.66)***	–0.0345 (–5.60)***
Abs_acc	–0.2131 (–9.36)***	–0.0915 (–3.38)***	–0.1498 (–0.92)
ShareInc	0.0150 (1.67)*	0.0110 (3.45)***	0.0149 (2.20)**
Change	0.0068 (1.79)*	0.0057 (1.41)	0.0032 (0.52)
Ownship	0.0003 (2.61)***	0.0000 (0.33)	0.0001 (0.71)
<i>N</i>	2117	1723	
<i>R</i> ²	26.86%	25.82%	

Big = an auditor type dummy variable equal to 1 if auditor is Big Six; OCF = operating cash flows divided by total assets; Size = natural logarithm of total assets; HiLev = dummy variable indicating whether firms are among the highest decile leverage, by year and industry; Abs_acc = absolute value of total accruals; ShareInc = dummy variable equal to 1 when there is an increase of more than 10% of the total outstanding shares during the year; Change = dummy variable equal to 1 when there is an auditor change; Ownship_{*it*} = percentage of ownership by the largest shareholders including related parties.

^a The *t*-statistics are calculated using the variability in the yearly coefficient estimate as in Becker et al. (1998).

* Significant at 10% level.

** Significant at 5% level.

*** Significant at 1% level.

The negative coefficient on the leverage dummy variable is consistent with the result of DeAngelo et al. (1994), that troubled companies are more likely to manage discretionary accruals to reduce earnings due to contractual negotiations. The coefficient on the absolute value of total accruals is negative, which is consistent with Becker et al. (1998). This implies that managers of firms with large accruals tend to reduce earnings. The increase in the number of outstanding shares is also significantly positively related to discretionary accruals, suggesting that managers may manipulate earnings upward when there is seasoned-equity offerings because they may sell their personal holdings higher as part of and subsequent to equity offerings. This result is consistent with Teoh et al. (1998) and Yoon and Miller (2002a, 2002b). The ownership variable is also significantly positive, which is consistent with our expectation.

To check whether the Asian Currency Crisis and related corporate governance changes in Korea affect the results, we also reestimate the regression after deleting (excluding) firm-year observations after 1998 because the Foreign Currency Crisis started at the end of 1997 and began to affect the Korean audit environment in 1998. The second column of Table 4 presents the regression-estimation results without the 1998 firm-year observations. As you will note, the results are almost the same as those estimated with 1998 firm-year observations. Big Six dummy is still not significant at all, while most control variables show significant coefficients with expected signs.

If discretionary accruals reverse, using pooled data may not be appropriate. Because previous studies show that discretionary accruals reverse, we estimate the regression equation (3) yearly for 5 years of the sample period, and calculate *t* statistics using the

variability in the annual-coefficient estimates as in Becker et al. (1998) and Bernardi (1997) to check whether the results that use pooled data change. The last column of Table 4 shows the average coefficients for the five yearly estimates along with related *t* statistics. The results are consistent with the pooled regression estimation except that size and ownership variables lose significance. In particular, the coefficient on the Big Six dummy variable is $-.0003$ and not significant at all at any conventional level. That is, firms with Big Six auditors show indifferent levels of discretionary accruals compared to firms with non-Big Six auditors. While this result is not consistent with the results of previous studies in other countries, it is consistent with the results in Park et al. (1999) and our expectation.

To analyze the effect of auditor-change direction on discretionary accruals after controlling for other influences on discretionary accruals, we estimate Eq. (4) using the second set of data. Table 5 reports the results of the multivariate-regression analysis, including the control variables.

Table 5
The effect of Auditor-change direction on discretionary accruals [DA_{it} (or ΔDA_{it}) = $\beta_0 + \beta_1 \text{NB-change}_{it} + \beta_2 \text{BN-change}_{it} + \beta_3 \text{OCF}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{HiLev}_{it} + \beta_6 \text{Abs_acc}_{it} + \beta_7 \text{ShareInc}_{it} + \beta_8 \text{Ownship}_{it} + e_{it}$]

	All firms		Designated-change firms		Free-change firms	
	DA (<i>t</i> statistic)	ΔDA (<i>t</i> statistic)	DA (<i>t</i> statistic)	ΔDA (<i>t</i> statistic)	DA (<i>t</i> statistic)	ΔDA (<i>t</i> statistic)
Intercept	-0.1370 (-1.28)	-0.2001 (-1.27)	0.0359 (0.26)	0.0124 (0.06)	-0.2594 (-1.59)	-0.3066 (-1.30)
NB-change	-0.0136 (-0.72)	-0.0367 (-1.32)	-0.0367 (-1.41)	-0.0231 (-0.60)	0.0097 (0.36)	-0.0332 (-0.85)
BN-change	-0.0205 (-1.21)	0.0046 (0.19)	-0.0005 (-0.02)	0.0336 (1.03)	-0.0225 (-0.87)	-0.0048 (-0.13)
OCF	-0.643 (-8.28)***	-0.6677 (-5.82)***	-0.4579 (-4.89)***	-0.3202 (-2.31)**	-0.8982 (-6.88)***	-1.1288 (-6.00)***
Size	0.0089 (1.62)	0.0123 (1.51)	0.0016 (0.22)	0.0036 (0.35)	0.0131 (1.51)	0.0140 (1.11)
HiLev	-0.0193 (-0.86)	-0.0378 (-1.14)	0.0013 (0.05)	-0.1470 (-0.41)	-0.0518 (-1.12)	-0.0607 (-0.91)
Abs_acc	-0.0877 (-0.83)	0.1564 (0.46)	-0.3316 (-2.46)**	-0.2536 (-1.27)	0.2179 (1.31)	0.5243 (2.18)**
ShareInc	-0.0007 (-0.04)	-0.0099 (-0.39)	-0.0039 (-0.17)	0.0001 (0.00)	0.0045 (0.18)	-0.0080 (-0.22)
Ownship	0.0003 (0.67)	0.0004 (0.51)	-0.0006 (-0.94)	-0.0017 (-1.86)*	0.0015 (1.83)*	0.0030 (2.61)***
Adjusted R^2	26.2%	12.4%	28.6%	10.4%	28.9%	21.7%
<i>F</i> statistic	12.20***	5.49***		2.82***	7.43***	5.44***
<i>N</i>	254	254	125	125	129	129

ΔDA = change in discretionary accruals; NB-change = auditor change dummy variable, when firms change their auditor from non-Big 6 auditor to Big 6 auditor assign 1, otherwise 0; BN-change = auditor change dummy variable, when firms change their auditor from Big 6 auditor to non-Big 6 auditor assign 1, otherwise 0; Other variables are the same as in Table 4.

* Significant at 10%.

** Significant at 5%.

*** Significant at 1%.

The adjusted R^2 s of the regressions for all sample firms, designated-change firms, and free-change firms are 26.2%, 28.6%, and 28.9%, respectively, when discretionary accruals are the dependent variable. When the change in discretionary accruals is used as the dependent variable, the adjusted R^2 s of the regression are 12.4%, 10.5%, and 21.7% for all sample firms, designated firms, and free-change firms, respectively. The F statistics show that all the multivariate-regression models are valid.

As Table 5 reveals, auditor change direction variables (NB-change and BN-change) are not statistically significant in any regressions when all firms are used. To check whether this result is driven by the method of auditor change, we divide the sample into two groups, free change and designated change, and run the regression. Park (1996) shows that firms with designated auditors report fewer discretionary accruals than other firms. If firms that switch from Big Six to non-Big Six auditors change auditors by order of the SFC, while firms that switch from non-Big Six to Big Six auditors change auditors by their own decision, there is no difference in discretionary accruals even though firms with Big Six auditors report fewer discretionary accruals. However, either in the free-change sample or the designated-change sample the auditor change direction variables are not significant in any regression, implying that the sample results are not driven by the method or direction of auditor change. This issue will be examined further in sensitivity analysis. Among the control variables, only operating cash flows (OCFs) have a significant expected coefficient, that is, a significant negative coefficient. The ownership variable (Ownship) is statistically significantly positive regardless of the dependent variable for the free-change sample, but is not significant for all samples.

5.3. Sensitivity test

To check the robustness of our analysis for the first hypothesis, we replicate the tests of Becker et al. (1998). That is, we define total accruals as the difference between earnings and operating cash flows, estimate discretionary accruals using the cross-sectional version of the Jones model, and reestimate Eqs. (3) and (4). However, the coefficients on auditor type and auditor change direction variables are not significant. The results are not reported in the paper. We also calculate the Spearman correlation among the independent variables to check whether multicollinearity exists among the variables. We find that there is no statistically significant correlation among variables.

To check the robustness of results for the second and third hypotheses, we reestimate the regression by using only firms that change their auditor from non-Big Six to Big Six (NB change sample), and firms that change their auditor from Big Six to non-Big Six (BN change sample), respectively. Auditor-change variables are not statistically significant in all these regressions. The results are not reported in the paper.

The statistical insignificance of auditor change may be attributed to the fact that our sample includes the period when there are significant changes in the accounting and auditing systems in Korea. There have been many changes in accounting and audit-related laws and regulations and auditing practices in Korea since the 1997 Foreign Currency Crisis. Therefore, we separate the sample into two periods: before the crisis (1994–1997) and after the crisis (1998), and reestimate the regressions. Again both auditor-change variables are not significant in all regressions.

The reasons for auditor change might affect the relation between auditor change and discretionary accruals. Therefore, we add a dummy variable for auditor-change reasons to regression Eq. (3). This dummy variable is one when firms change their auditor because the SFC in Korea designates the auditor, zero otherwise. The following equation is used in the regression estimation.

$$\begin{aligned} DA_{it} \text{ (or } \Delta DA_{it}) &= \beta_0 + \beta_1 \text{DEG} (1 + \gamma_1 \text{NB-change} + \gamma_2 \text{BN-change}) \\ &\quad + \beta_3 \text{OCF}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{HiLev}_{it} + \beta_6 \text{Abs_acc}_{it} + \beta_7 \text{ShareInc}_{it} \\ &\quad + \beta_8 \text{Ownship}_{it} + e_{it} \\ &= \beta_0 + \beta_1 \text{DEG} + \beta_1 \gamma_1 \text{DEG} \times \text{NB-change} + \beta_1 \gamma_2 \text{DEG} \\ &\quad \times \text{BN-change} + \beta_3 \text{OCF}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{HiLev}_{it} + \beta_6 \text{Abs_acc}_{it} \\ &\quad + \beta_7 \text{ShareInc}_{it} + \beta_8 \text{Ownship}_{it} + e_{it} \end{aligned} \quad (5)$$

where DEG is a dummy for auditor-change reason. Other variables are the same as in Eq. (4).

When auditors are designated by order of the SFC, they are usually assigned to a firm for 3 years. These auditors, then, do not need to worry about next year's contract, making them more independent. Previous studies find that auditors are more likely to constrain aggressive accounting by management when they are independent (Park, 1996). Table 6 presents the regression results of Eq. (5). All the signs of the auditor-change variable for the designated-change sample are the same as the results in the previous analysis. That is, none of the coefficients of $\text{DEG} \times \text{NB-change}$ variable and $\text{DEG} \times \text{BN-change}$ variable is statistically significant in any regressions. Among the

Table 6

The effect of auditor designation on discretionary accruals [DA_{it} (or ΔDA_{it}) = $\beta_0 + \beta_1 \text{DEG} + \beta_1 \gamma_1 \text{DEG} \times \text{NB-change} + \beta_1 \gamma_2 \text{DEG} \times \text{BN-change} + \beta_3 \text{OCF}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{HiLev}_{it} + \beta_6 \text{Abs_acc}_{it} + \beta_7 \text{ShareInc}_{it} + \beta_8 \text{Ownship}_{it} + e_{it}$]

Independent variables (expected sign)	DA (<i>t</i> statistic)	DA (<i>t</i> statistic)
Intercept	-0.1426 (-1.34)	-0.2164 (-1.38)
DEG (dummy)	-0.0036 (-0.21)	-0.0298 (-1.16)
DEG × NB-change	-0.0366 (-1.28)	-0.0254 (-0.60)
DEG × BN-change	-0.0110 (0.46)	0.0133 (0.38)
OCF	-0.6463 (-8.21)***	-0.6739 (-5.80)***
Size	0.0089 (1.61)	0.0129 (1.59)
HiLev	-0.0157 (-0.69)	-0.0288 (-0.86)
Abs_acc	0.0779 (-0.71)	0.1034 (0.66)
ShareInc	-0.0026 (-0.15)	-0.0108 (-0.42)
Ownship	0.0004 (0.88)	0.0006 (0.79)
Adjusted R^2	26.08%	12.38%
<i>F</i> statistic	10.92***	4.97***
<i>N</i> of observations	254	254

DEG=auditor-change-reason dummy. When auditor is changed by the designation, DEG is 1, otherwise 0. Other variables are the same as in Table 5.

*** Significant at 1% level.

control variables, only the operating cash flows variable reveals significant negative coefficients.

Overall, several sensitivity analyses do not change the results in Table 5, that auditor-change variables (BN-change, NB-change) are related to discretionary accruals. This implies that a finding of no difference in discretionary accruals is not a period-specific or sample-specific phenomenon.

6. Summary and conclusion

In this study, we investigate the relation between discretionary accruals, auditor type, and auditor-change direction. We investigate whether there is any audit-quality difference between Big Six and non-Big Six auditors and whether auditor change affects the number of discretionary accruals. Empirical results show that there is no statistically significant difference between discretionary accruals of firms with Big Six and non-Big Six auditors. In addition, the discretionary accruals of firms that change from non-Big Six to Big Six auditors are not significantly different from those of firms that change from Big Six to non-Big Six auditors. Furthermore, there is no statistically significant difference in the change in discretionary accruals between these two groups. This result is consistent after controlling for other relevant variables that may affect discretionary accruals and does not change in several sensitivity tests.

We interpret this result as meaning that there may be no difference in audit quality between Big Six and non-Big Six auditors in Korea during the sample period. The result is consistent with results in other studies in Korea, while inconsistent with many previous studies on audit quality in other countries (e.g., Becker et al. 1998; DeAngelo 1981; Palmrose 1988). In Korea, there may be different incentives for auditors to provide high- or low-quality audits because the economic and institutional environments in Korea are different from other countries.

This study adds new evidence to the audit-quality literature by showing that financial statements audited by Big Six auditors may not provide higher quality information in certain economic environments. This implies that when we use auditor type as a proxy for audit quality we may need to consider economic environments. As Becker et al. (1998) point out there is still questions about the wisdom of using discretionary accruals as a proxy for auditor quality. In addition, further research is necessary to find out what other factors motivate auditors to provide audits of different quality.

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The decision relevance and timeliness of accounting earnings in Saudi Arabia

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Abstract

This study examines the decision relevance and timeliness of accounting earnings in Saudi Arabia during the 1995–1999 sample period. The empirical results suggest that the publication of accounting earnings does not cause significant revision to the *market* assessment of future cash flows of Saudi firms. On the other hand, it appears that the publication of accounting earnings leads *individual* investors to revise their security holdings. However, this evidence is limited to cases where firms reported profit. The empirical results further suggest that earnings are timely in terms of their association with security returns and that increasing the measurement interval significantly improves this association. The tests also show that positive and negative earnings have differential implications for the timeliness of accounting earnings. Further tests show that this evidence is not consistent with the loss liquidation argument [*J. Account. Econ.* 20 (1995) 125] and, potentially, may reflect the lack of tax incentives to liquidate investments in loss firms. Finally, the results show that Saudi managers do not incorporate economic losses into accounting earnings on a timely basis which may reflect reduced market demand for accounting information, low levels of public debt, low expected litigation costs, and weak monitoring by analysts and other stakeholders.

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1. Introduction

The last three decades witnessed the emergence of a research paradigm that tests the relation between alternative capital markets metrics (e.g., security prices, security

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returns, and trading volume) and accounting data (such as earnings, book value, among others). The aim of these tests is to provide insights into the relevance and reliability of accounting data for members of the investment community and, perhaps, for standard setters. They test the decision relevance and timeliness of accounting information.

The majority of research on the decision relevance and timeliness of accounting data uses data from the United States, the United Kingdom, and the Australian capital markets. Recently, there has been a growing interest in alternative national accounting models. For example, Ball, Kothari, and Robin (2000) examine the effect of international institutional factors on two properties of accounting earnings: timeliness and conservatism. Their sample includes firms from common-law countries (Australia, Canada, UK, and United States) and code-law countries (France, Germany, and Japan). Similarly, Ball, Robin, and Wu (2000) conduct a similar study using a sample of firms from Hong Kong, Malaysia, Singapore, and Thailand. In addition, some studies examine the relevance of accounting information in other emerging markets. For example, Chen, Chen, and Su (1999) investigate the relevance of accounting earnings in China, Choi and Choe (1998) investigate the effects of annual earnings announcements on investors' trading behavior in the Korean stock market.

To date, the extant literature lacks significant empirical evidence on the current role of accounting information in security valuation in the Saudi security market, despite its status as one of the largest (by market capitalization) among emerging markets.¹ This paper aims at addressing this gap by investigating the decision relevance and timeliness of accounting information in Saudi Arabia during the 1995–1999 sample period. Furthermore, following Hayn (1995), we assess the differential implications of positive versus negative earnings on the timeliness of accounting earnings. Finally, we examine the extent to which accounting earnings asymmetrically incorporates economic losses relative to economic gain (i.e., the impact of accounting conservatism as defined by Basu, 1997) in Saudi Arabia.

We argue that the role of accounting information in security valuation warrants an empirical investigation due to factors that impact both the demand placed on accounting information and the supply of accounting information in Saudi Arabia. The empirical evidence gathered by this study helps to understand the role of accounting information in security valuation in Saudi Arabia and possibly have policy implications for accounting standard setters in Saudi Arabia.

With respect to the demand placed on accounting information, the government of Saudi Arabia has recently outlined a number of initiatives that aim to foster a greater local and international private sector involvement in its economic development activities, and it has opened the door for more involvement by non-Saudi nationals to invest in its capital markets. These initiatives are likely to increase the demand placed on accounting information by current and perspective investors. On the other hand, many large, listed

¹ Notable exceptions include the work of Al-Bogami, Green, and Power (1997), who used an event study to investigate the market reaction to quarterly earnings announcements of 39 listed Saudi firms during the 1987–1991 sample period.

Saudi companies are partially owned by the Saudi Government. The high concentration of government ownership for these companies is likely to mean higher levels of information asymmetry.² Furthermore, some listed Saudi companies are family controlled; one family often holds a controlling interest in various public and private companies. Some of these companies are tied together by cross holdings and personal relationships. This form of ownership may lead to direct access to insider information by government officials while the public continues to face information asymmetry. This setting, in turn, creates alternative forms of contracting relationships and is likely to reduce the demand for public disclosure and the demand for timely and transparent accounting information.

With respect to the supply of accounting information, in contrast to many developed economies where the provision of accounting information is governed by a national set of Generally Accepted Accounting Principles (GAAP), the Saudi firms have traditionally adopted Anglo-American GAAPs (U.S. GAAP, U.K. GAAP, and more recently, International Accounting Standards GAAP). While the establishment of a domestic standard-setting body in 1992, the Saudi Organization for Certified Public Accountants (SOCPA) has helped to reduce reporting diversity. SOCPA is still very much in its early stages, having released only 16 accounting standards. Both decision relevance and timeliness of accounting information in Saudi Arabia are likely to be influenced by the degree of alignment between the underpinnings for Anglo-American type of GAAP and the principles and doctrines adopted by the Saudi investment community. In addition, the low expected cost of litigation in Saudi Arabia, as well as the lack of a public debt market (due to Islamic tradition), suggests that Saudi managers and auditors may have low incentives to produce timely and transparent financial reports. That is, from a supply point of view, accounting information may have a lower impact on security prices in Saudi Arabia than in other countries.

The next section provides a brief overview of key Saudi institutional factors. Section 3 discusses the research design. Section 4 discusses the research findings. Section 5 concludes the study.

2. Key Saudi institutional factors

The Kingdom of Saudi Arabia is an Arabic Islamic monarchy, headed by the King, who also serves as the country's Prime Minister. The King exercises his authority through a body referred to as the Council of Ministers. Two other councils advise the King and Council of Ministers. The first council is the Consultative Council (*Majlis*

² Traditionally, information asymmetry has been interpreted as differences between managers and owners of firms. That is, managers possess private information about the firm and its earnings that shareholders do not have. In the context of this paper, we argue that information asymmetry in Saudi Arabia exists between investors themselves (government vs. nongovernment). Indeed, these two groups differ in their information resources, their investment horizons, and their investment strategy.

Alshoura), which includes academics, businesspeople, government members, and religious scholars. The second council is the Council of the Assembly of Senior Religious Scholars (*Majlis Kibar al-Ulama*), a body that is charged with the responsibility of ensuring that Saudi Arabia is governed in conformity with Islamic law and teaching.

Islamic teaching plays the major role in the formulation and development of the legal system in Saudi Arabia. The *Qur'an*, the holy book of Islam, is the most important source of legislation, followed by the *Sunna*, the teachings of the Prophet Mohammed. As a matter of Islamic law, if an authoritative legal statement from the *Qur'an* or the *Sunna* (collectively referred to as *Shari'a*) can be cited, it is binding and supersedes all other sources of legislation (Ernst & Young International, 1998, pp. 56–58). Other sources of law in Saudi Arabia include Royal and Ministerial Decrees and Departmental Circulars.

2.1. The Saudi economic and financial system

The Saudi economy, the largest in the Middle East, has been developed through a series of 5-year plans. These plans have been formulated to pursue economic diversification through the development of private sector activities as well as greater economic development from the private sector. The government's commitment to foster greater private sector involvement in its economic development activities suggests that the private sector will play a leading role in financing these development activities, creating a greater demand for relevant and reliable financial information to facilitate effective decision making. It also suggests that financial markets in Saudi Arabia will be more active and move toward sophisticated trading arrangements.

Saudi Arabia does not have a physical stock market location; the exchange of stocks is conducted through a computerized network. The Saudi stock market is the eighth largest stock market by market capitalisation in the developing world, and it is the largest stock market in the Arab world, accounting for 63% of the volume of shares on all Arabian stock exchanges. Generally speaking, only Saudi nationals may own or, otherwise, deal in shares listed on the Saudi exchange. However, nationals of other Gulf countries (GCC) may also own shares in certain joint stock companies. In 2000, the government permitted non-Saudi nationals who reside in Saudi Arabia to invest in the Saudi stock market through existing local funds managed by domestic commercial banks. As a result of these governmental initiatives, there are currently 132 investment funds managed by commercial banks.

2.2. The Saudi accounting profession

The accounting profession in Saudi Arabia is young, but maturing, as it undergoes continuous development. During its infancy, there was no comprehensive, authoritative support. This condition changed with the passage of the first Law of Certified Accountants in 1992. Article 19 of the Law established the first authorized professional association of accountants, the SOCPA. SOCPA is responsible for regulating the accounting profession and its practices. The regulatory sources of law governing the accounting profession

include the Companies Act, the Zakat and Income Tax Act,³ the Ministry of Commerce (1986a,b) decision, and SOCPA regulations.

SOCPA introduced a professional qualification for Saudi nationals, modeled after the certified public accountants designation in the United States. The Ministry of Commerce license qualified individuals and associations of qualified individuals to practice. At the end of 1997, there were over 300 licensed practicing accountants in Saudi Arabia. The accounting profession is far weaker in Saudi Arabia than that in the West, but the accountants and their corporate clients' face lower expected litigation cost. While the Ministry of Commerce and SOCPA host a committee that investigates any wrongdoing in the profession, the procedures and decisions of this committee are not disclosed to the public. To date, not a single audit firm has been sued, even in cases of corporate failure.

Since its inception, SOCPA has issued 16 accounting standards. Accordingly, Saudi companies do not yet have a unified set of GAAP, and Saudi companies are still informally guided by U.S., UK and/or IAS standards.

3. Research design

3.1. The decision relevance of accounting earnings

We assess the decision relevance of accounting earnings in Saudi Arabia in two ways. First, we utilize the research design of Ball and Brown (1968) to investigate the association between the sign of security returns and the sign of annual earnings of Saudi firms surrounding and during the release week of annual reports.⁴ If earnings provide a summary performance measure, we should observe positive (negative) security returns for profitable (losing) firms. We construct a wealth index to trace the value of US\$ 1 invested (in equal amounts) in all securities at the end of Week 52 (i.e., 52 weeks prior to the week of the annual report) and held to Week +13 (i.e., 13 weeks after the week of the annual report). In other words:

$$WI_w = \frac{1}{N} \sum_i \prod_{TP} (1 + Ret_{i,w}) \quad (1)$$

³ Zakat is a religious wealth tax levied on Saudi and other GCC nationals and their wholly owned companies and that proportion of mixed-ownership companies that is owned by Saudi or other GCC nationals. Zakat is a fixed-rate tax of 2.5% on capital that is not invested in fixed assets or long-term investments. Income tax, on the other hand, is levied on companies wholly owned by foreign nationals and the proportion of mixed-ownership companies that is owned by foreign nationals. Income tax is levied on taxable income, which is calculated as gross income less all expenses that are necessarily incurred in earning income and satisfy the deductibility rules. The current rate of corporate income tax in Saudi Arabia varies from 25% to 45%, with no tax-free threshold.

⁴ Note that Saudi firms do not announce earnings ahead of the annual report release date. Note also that Saudi investors may have access to private information about firm performance before the release week of the annual report (a research in-progress by one of the authors of this paper suggests that information leakage is present in the Saudi market). For these reasons, we examine the market movement surrounding and including the annual report release date.

where Wl_{it} is the wealth index during week w ; $Ret_{j,w}$ is the raw rate of return for security j during week w ; and N is the number of securities.

Similar with Ball and Brown (1968),⁵ the wealth index is then plotted for portfolios constructed for (1) all firms and years, (2) all firms and years in which the reported earnings level figure is positive, and (3) all firms and years in which the reported earnings level figure is negative. Chi-square statistics are computed for a 2×2 classification of firms by the sign of earnings levels and the sign of raw returns for each week.

Second, we use the research design of Beaver (1968) to investigate the presence of any abnormal trading volumes surrounding and during the release week of the annual report. Benchmarked against trading volume during nonreporting weeks, we investigate the presence of abnormal trading volume movements during (and surrounding) the annual report release date. Similar to Beaver, a weekly average of daily percentage of shares traded is calculated for each firm for each week in the report period as follows:

$$V_{j,w} = \left(\frac{\text{number of shares of firm } j \text{ traded during week } w}{\text{number of shares outstanding of firm } j \text{ traded during week } w} \right) \times \frac{1}{\text{number of trading days during week } w} \quad (2)$$

The weekly volume is divided by the number of shares outstanding to remove any bias caused by the presence of firms with a large number of shares outstanding. The percentage of shares traded per week is divided by the number of trading days to adjust for nontrading days such as public holidays. The normal trading week in Saudi Arabia is equal to 5.5 days (five full days and one half day on Thursdays). The report release period is defined as the 7-week period surrounding and including the release week (3 weeks before the release date, the report release week, and 3 weeks after the report release week). We compute the average volume across all observations for each week during the report period, benchmarked against the average volume during the nonreport period (Week 52–4, Week +4–+13).

3.2. *The timeliness of accounting earnings in Saudi Arabia*

We use the research design of Easton and Harris (1991) to investigate the extent to which accounting earnings incorporate current period economic income, as proxied by security returns. We assess timeliness by examining the contemporaneous relationship between the earnings levels, earnings changes, and security returns of Saudi firms over 1-, 2-, and 5-year intervals. Following Easton and Harris and Easton, Ohlson, and

⁵ Our index differs from the Ball and Brown (1968) index in that it does not control for market-wide factors. However, the use of an index identical to that of Ball and Brown does not change our findings.

Harris (1992), the following regression is estimated for the pooled cross-sectional and time-series sample, as well as for each of the intervals noted above:

$$\text{Ret}_{i,t} = \alpha + \beta_1(E_{i,t}/P_{i,t-1}) + \beta_2(\Delta E_{i,t}/P_{i,t-1}) + \varepsilon_{i,t} \quad (3)$$

where E is the earnings level per share; ΔE is the earnings change per share Ret raw annual security return; and P the price per share of firm i at time t .

Similar with Easton and Harris (1991), we assess timeliness by examining the explanatory power of the model (adjusted R^2) in Eq. (3). Inferences about the impact of the length of the measurement interval on timeliness are drawn by examining the change in the explanatory power (adjusted R^2) of Eq. (3) as the measurement interval increases.

3.3. The differential implications of positive and negative earnings on the timeliness of accounting earnings

We use the research design of Hayn (1995) to investigate the differential implications of positive and negative earnings on the relationship between earnings and the annual security returns of Saudi firms. We divide the pooled sample into four groups. The first group includes observations where the level of earnings and the change in earnings are both positive. The second group includes observations where the level of earnings is positive but the change in earnings is negative. The third group includes observations where the level of earnings and the change in earnings are both negative. The final group includes observations where the level of earnings is negative but the change in earnings is positive. The regression model outlined in Eq. (3) is then estimated for each group. Inferences about the role of the sign of reported earnings on the association between security returns and earnings can be drawn from comparing the adjusted R^2 of the pooled model for each group for annual as well as longer measurement intervals (2 and 5 years).

3.4. Accounting conservatism in Saudi Arabia

We examine accounting conservatism in Saudi Arabia by utilizing the research design of Basu (1997), in which security returns proxy for economic income. Conservatism is defined as the extent to which current period accounting earnings asymmetrically incorporate economic losses relative to economic gain. Following Basu, we estimate a linear regression of accounting earnings on security returns as follows:

$$E_{i,t}/P_{i,t-1} = \alpha + \beta_1 \text{RD}_{i,t} + \beta_2 \text{Ret}_{i,t} + \beta_3 \text{Ret}_{i,t} \text{RD}_{i,t} + \varepsilon_{i,t} \quad (4)$$

where RD is a dummy variable equaling one if Ret is negative and zero otherwise.

Following Ball, Robin et al. (2000), we control for market-wide return by deducting the sample mean return in fiscal year t for calculating Ret . The coefficient β_2 measures the contemporaneous sensitivity of accounting earnings to positive security returns (economic gain). The coefficient β_3 measures the incremental sensitivity of accounting earnings to contemporaneous negative returns (economic loss).

3.5. Variable definitions

Ret	The raw security returns for firm i , adjusted for stock dividend, stock split, and capitalization changes compounded over the time period t , where t is either 1 week, 1 year, or 5 years.
V	The traded volume for security i adjusted for stock split over the contemporaneous week, t .
E	Earnings per share for firm i for period t excluding extraordinary items, discontinued operations, and zakat and tax obligations scaled by beginning-of-period price. ⁶
ΔE	Change in earnings per share for firm i for period t . This variable proxies for unexpected earnings for firm i for period t .

3.6. Sample selection procedures

This study uses data from the period 1995–1999. The sample is drawn from the total population of firms listed on the Saudi stock market during the full 5-year period. Of the 72 firms listed, 10 were excluded because they were suspended from trading on the Saudi Arabian stock market, pending satisfaction of certain operating and financial criteria imposed by the Saudi stock market. Of the remaining 62 firms, 52 firms satisfy our selection criteria:

- (1) Completing weekly share prices series for the 1995–1999 sample period;
- (2) completing financial statements data for at least 4 years from the 1995–1999 sample period;
- (3) completing dividend and stock-split data for the 1995–1999 sample period; and
- (4) by having clearly identifiable earnings announcement (annual report release) dates for each yearly observation.

The final sample represents 72% of the total population by number and represents 96.45% of the total population by market capitalization. The final data set includes 256 annual earnings announcements relating to 52 Saudi Arabian firms for the sample period 1995–1999.

3.7. Data sources

Due to the lack of any form of electronic market or financial database in Saudi Arabia at the time we conducted this research, all of the required data were hand collected. Weekly high, low, and closing stock prices and the trading volume for each security were

⁶ Zakat and tax obligations are excluded from the measurement of earnings for four distinct reasons. First, the sample consists of two groups of firms: (1) fully Saudi-owned firms that are required to pay only zakat, (2) partly Saudi-owned firms that are required to pay both zakat and income tax. Thus, ignoring zakat and tax obligations ensures a measure of consistency. Second, because the zakat obligation represents a religious duty, some firms believe that they should be in charge of paying only the minimum amount of zakat required by law. Accordingly, many firms may engage in active zakat management practice. Third, certain firms are entitled to special tax concessions for certain periods. Finally, flexibility inherent in the Saudi zakat and tax code generally leads to disputes between companies and ZITD regarding the amount due for zakat and tax, which suggests that it is difficult to ascertain a firm's final tax liability.

obtained from Saudi Arabian Monetary Agency. Dividend data were obtained from SSRC. Stock-split data were obtained from the *Saudi Stock Market Review* publications issued by Bakheet Financial Advisors. Financial accounting data were manually obtained from the relevant annual reports, hard copies of which were housed in the library of SOCPA or the library of the Institute of Public Administration in Riyadh, Saudi Arabia. Data for a few missing annual reports were obtained from the microfilm archives of three leading Saudi Arabian newspapers: *Al-Riyadh*, *Al-Jazeera*, and *Okaz*.

There is no database that contains earnings-announcement dates for firms listed on the Saudi stock market. Instead, all firms listed on the Saudi stock exchange are required by law to publish their complete financial statements in at least two Saudi newspapers within 3 months following the fiscal year-end. Accordingly, earnings-announcement dates were collected by hand from the microfilm archives of the financial sections of these newspapers. The archives of Saudi newspapers were carefully checked to determine the exact earnings-announcement date. This is defined as the date on which the complete financial statements of a firm first appeared in any Saudi newspaper.

4. Empirical results

4.1. Descriptive statistics

Table 1 presents the summary statistics for the main variables of interest. All accounting variables are stated on a per-share basis and scaled by beginning-of-period price. As can be seen in Table 1, the mean (median) value for annual earnings per share as a percentage of beginning share price is 4.8% (5.3%). Almost 25% of the firms reported annual losses. Two-year earnings are lower than twice annual earnings, and 5-year earnings are greater than five times annual earnings. Because the variables are scaled by beginning-of-period

Table 1
Descriptive statistics

Variable	Number of observations	Mean	S.E. of the mean	S.D.	Lower quartile	Median	Upper quartile	Percent negative
<i>(A) Annual pooled observations</i>								
E	254	0.048	0.008	0.130	− 0.003	0.053	0.103	25.09
RET	254	0.046	0.019	0.299	− 0.168	− 0.022	0.243	53.14
<i>(B) Two-yearly pooled observations</i>								
E	100	0.079	0.021	0.209	− 0.039	0.095	0.186	28.00
RET	100	0.178	0.043	0.435	− 0.173	0.163	0.420	36.00
<i>(C) Five-yearly pooled observations</i>								
E	48	0.258	0.053	0.364	− 0.012	0.285	0.543	23.07
RET	48	0.296	0.120	0.831	− 0.300	0.140	0.920	30.76

E: earnings per share excluding extraordinary items, discontinued operations, and zakat and tax obligations scaled by beginning-of-period price.

RET: annual security returns.

price, average reported values will tend to increase disproportionately over longer intervals due to the reinvestment of earnings and the influence of negative values.

The mean (median) value for annual security returns is 4.6% (–2.2%) and is significantly different from zero. Interestingly, while over 53% of the observations had negative annual security returns, this percentage is quite similar with those reported in U.S. studies. Nevertheless, aggregate security returns over longer intervals are positive, and the proportion of negative return realizations drop significantly.

Table 2 presents the time lag between the end of the fiscal year and the week of the release of the annual report (earnings-announcement week) for the sample firms. The average lag period in weeks is 11.50, 10.73, 10.63, 10.80, and 7.10 during 1995, 1996, 1997, 1998, and 1999, respectively. While it is not clear why there has been a sharp drop in the average lag period during 1999, the average time lag in each sample year is below the 3-month rule imposed by SOCPA. By the end of Week 4, 13% of the firms released their annual report, and by the end of Week 13, 70% of the firms released their annual report.

As can be seen in Table 3, the most frequent firm year-end in Saudi Arabia is December, used by approximately 83% of the sample. During the sample period, no firm studied changed its year-end. The most frequent annual report release month is March, which accounted for 27% of the sample, and the months of January, February, and March, combined, accounted for 63%.

4.2. The decision relevance of accounting earnings in Saudi Arabia

Fig. 1 plots the average weekly wealth indices for three portfolios constructed from all firms and all years. The first portfolio includes all 256 observations. The positive portfolio includes 191 observations, all of which had positive reported earnings. The negative portfolio includes 65 observations, all of which had negative reported earnings.

Table 2
Number of weeks between fiscal year-end and annual report release date

Number of weeks	Number of releases					Total	Cumulative %
	1995	1996	1997	1998	1999		
4 or less than 4	5	4	7	1	16	33	13
5	3	5	1	4	10	23	22
6	1	2	1	5	7	16	28
7	2	4	4	2	1	13	33
8	1	0	3	2	1	7	36
9	1	3	1	1	1	7	39
10	5	3	5	6	3	22	47
11	2	5	4	7	0	18	54
12	4	4	4	7	0	19	62
13	6	5	7	1	2	21	70
14	3	3	5	5	0	16	76
15	5	4	0	1	3	13	81
More than 15	14	10	10	10	4	48	100
Total	52	52	52	52	48	256	

Table 3
Distribution of financial statement and announcements dates

Month	Firm year-end		Times earnings reports were announced in each month		
	Number	%	Number	%	Cumulative %
January		0.00	39	15	15
February		0.00	54	21	37
March	2	0.04	68	27	63
April		0.00	34	13	77
May	4	0.08	14	6	82
June		0.00	9	4	86
July	2	0.04	12	5	91
August		0.00	12	5	95
September	1	0.02	5	2	97
October		0.00	1	0	98
November		0.00	4	2	99
December	43	0.83	2	1	100
Total	52	100	254		

Fig. 1 shows a marked positive association between the signs of the reported earnings and of the wealth index. The weekly chi-square statistics for the 2×2 classification by the signs of the reported annual earnings and of wealth index show that it is unlikely that there is no relationship between the two signs in the majority of the weeks up to that of annual-report announcement. These statistics are especially strong for the total sample portfolio and for the positive-earnings portfolio. The chi-square statistics for the negative-earnings portfolio are only significant during 32 weekly periods.

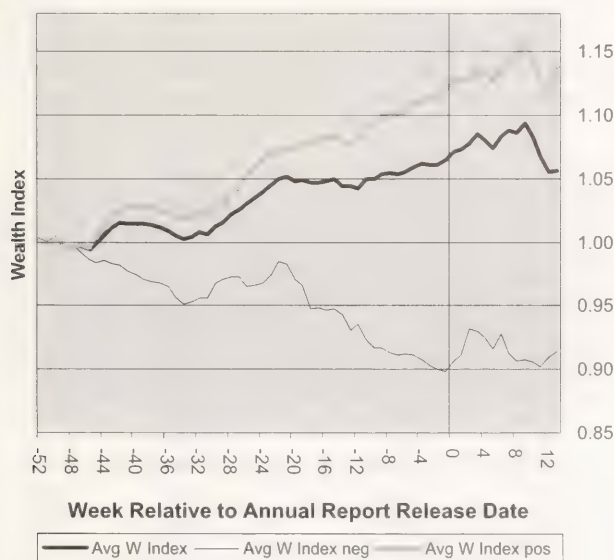


Fig. 1. Wealth index for various portfolios (earnings levels).

Consistent with the U.S. evidence reported in Ball and Brown (1968) and the Australian evidence reported in Brown (1970), we infer from Fig. 1 that most of the information contained in reported earnings is anticipated by the Saudi market before the annual report is released because the release of the actual earnings number does not appear to cause any unusual jumps in the wealth index during the announcement week. The upward and downward drifts begin at least 52 weeks before the annual report is released. This evidence suggests not only that the Saudi market begins to anticipate reported earnings 52 weeks before the announcement week but also that it continues to do so with increasing success. Consistent with international evidence, the upward drift for the positive earnings portfolio continues for approximately 10 weeks after the announcement

Table 4

Average wealth index statistics for total sample portfolio, positive earnings portfolio, and negative earnings portfolio

Weeks	Average wealth index	Average wealth index (negative)	Average wealth index (positive)	Weeks	Average wealth index	Average wealth index (negative)	Average wealth index (positive)
-52	1.0018	1.0000	1.0020	-19	1.0491	0.9666	1.0768
-51	0.9991	1.0000	0.9982	-18	1.0474	0.9477	1.0806
-50	1.0031	1.0030	1.0031	-17	1.0470	0.9485	1.0799
-49	0.9950	0.9948	0.9950	-16	1.0476	0.9471	1.0812
-48	0.9955	0.9957	0.9954	-15	1.0501	0.9472	1.0844
-47	0.9970	0.9921	0.9984	-14	1.0443	0.9432	1.0780
-46	0.9939	0.9869	0.9960	-13	1.0439	0.9311	1.0798
-45	0.9988	0.9842	1.0033	-12	1.0429	0.9356	1.0803
-44	1.0048	0.9861	1.0106	-11	1.0498	0.9232	1.0920
-43	1.0120	0.9834	1.0210	-10	1.0500	0.9167	1.0945
-42	1.0150	0.9824	1.0252	-9	1.0535	0.9171	1.0990
-41	1.0147	0.9776	1.0262	-8	1.0546	0.9135	1.1017
-40	1.0149	0.9744	1.0277	-7	1.0536	0.9117	1.1010
-39	1.0147	0.9708	1.0286	-6	1.0551	0.9119	1.1029
-38	1.0133	0.9691	1.0273	-5	1.0588	0.9118	1.1078
-37	1.0119	0.9679	1.0259	-4	1.0615	0.9077	1.1128
-36	1.0094	0.9654	1.0234	-3	1.0607	0.9026	1.1134
-35	1.0055	0.9567	1.0210	-2	1.0606	0.8999	1.1142
-34	1.0024	0.9516	1.0186	-1	1.0648	0.8985	1.1203
-33	1.0039	0.9534	1.0199	0	1.0717	0.9068	1.1266
-32	1.0083	0.9561	1.0251	1	1.0727	0.9112	1.1256
-31	1.0058	0.9562	1.0215	2	1.0780	0.9319	1.1282
-30	1.0130	0.9676	1.0276	3	1.0855	0.9298	1.1365
-29	1.0159	0.9708	1.0308	4	1.0802	0.9257	1.1314
-28	1.0218	0.9726	1.0381	5	1.0743	0.9164	1.1269
-27	1.0256	0.9726	1.0430	6	1.0837	0.9282	1.1349
-26	1.0303	0.9653	1.0516	7	1.0884	0.9135	1.1454
-25	1.0350	0.9663	1.0579	8	1.0865	0.9066	1.1462
-24	1.0396	0.9678	1.0635	9	1.0932	0.9080	1.1576
-23	1.0455	0.9748	1.0690	10	1.0821	0.9061	1.1414
-22	1.0495	0.9850	1.0709	11	1.0675	0.9022	1.1263
-21	1.0516	0.9829	1.0746	12	1.0553	0.9091	1.1157
-20	1.0482	0.9713	1.0739	13	1.0563	0.9146	1.1371

week. Surprisingly, there does not appear to be any postearnings announcement drift for the negative-earnings portfolio. If anything, it appears that the market goes through a period of correction for potential overreaction.

Table 4 presents the weekly wealth index values for three portfolios shown in Fig. 1. The average annual wealth index value for the total sample increased by 7.17% during the 52 weeks leading to the annual report release week. The average annual wealth index value for the positive (negative) earnings portfolio increased (decreased) by 12.03% (9.32%) during the 52 weeks leading to the annual report release date.

Only 11% (1%) of the increase (decrease) in the wealth index for the positive (negative) earnings portfolio took place during the 4 weeks leading to the annual report release date. Consistent with international evidence in the United States and Australia, this finding suggests that the release of the annual earnings reports is not providing decision-relevant information to Saudi market participants because most of the information contained in earnings have trickled into the market throughout the year.

Fig. 2 shows the average trading volume across all observations for each week during the 7-week report period (3 weeks before and 3 weeks after the report release week, as well as the report release week itself).

The average trading volume during the nonreport release period is 0.156%, and the average volume during the week of the release of the annual report is 0.186%, which is 19.23% larger than that during the nonreport release period and is the largest during the reporting period. This finding clearly shows that individual Saudi investors do shift their portfolio positions at the time of the annual report release week.

The above analysis is further extended by examining the trading volume of profit-reporting firms separately from that of loss-reporting firms. Effectively, the calculation of relative volume (V) is replicated for each group. The average trading volume of profit- (loss-) firms during the reporting period is benchmarked on the average trading volume of profit- (loss-) reporting firms during nonreporting periods.

Fig. 3 shows the average volume across all profit-reporting observations for each week during the 7-week report period (3 weeks before and 3 weeks after the report release week,

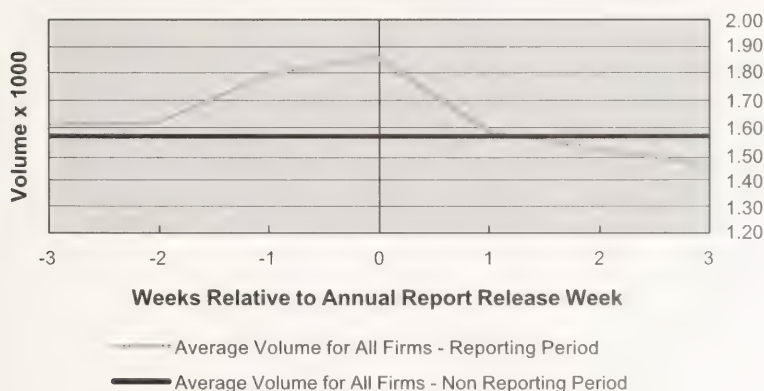


Fig. 2. Volume analysis (all firms).

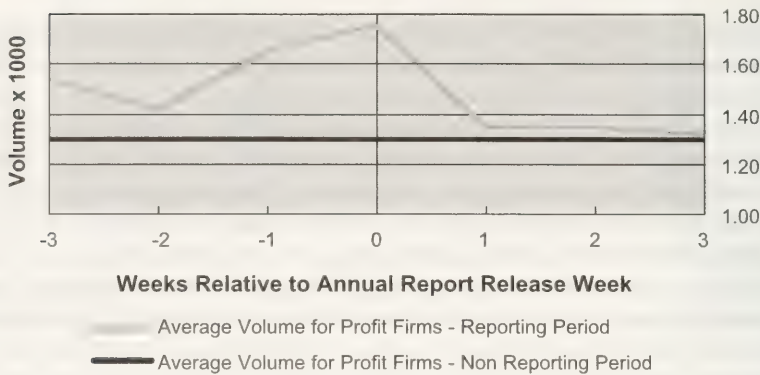


Fig. 3. Volume analysis (profit firms).

as well as the report release week itself). The average trading volume for profit-reporting firms during the nonreport release period is 0.13%, which is lower than that for the total sample. The average volume during the week of the release of the annual report of profit firms is 0.175%, which is also lower than that for the total sample, but is 34.6% larger than that during the nonreport release period and is the largest during the reporting period. Consistent with the evidence reported for the total sample, this finding clearly shows that individual Saudi investors do shift their portfolio positions at the time of the annual report release week of profit-reporting firms.

Fig. 4 shows the average volume across all loss-reporting observations for each week during the 7-week report period (3 weeks before and 3 weeks after the report release week, as well as the report release week itself).

The average trading volume for loss-reporting firms during the nonreport release period is 0.23%, which is significantly higher than that for the total sample and for the profit group. The average volume during the week of the release of the annual report of loss-reporting

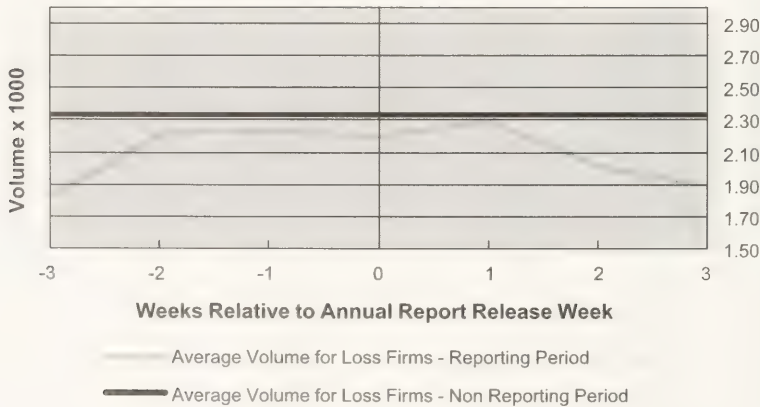


Fig. 4. Volume analysis (loss firms).

firms is 0.22%, which is higher than that for the total sample and for the profit group (mostly because they represent some of the largest Saudi companies), but is 5% lower than that during the nonreport release period. Interestingly, all of the weekly trading volume averages during the reporting period are lower than that during the nonreport release period. This evidence stands in contrast to that reported for the total sample and for the profit group and clearly shows that individual Saudi investors do not shift their portfolio positions at the time of the annual report release week of loss-reporting firms. In the spirit of Hayn (1995), this finding may suggest that Saudi investors perceive reported losses by Saudi firms to be temporary. However, because there are no tax implications for losses on investments in shares by Saudi investors, the reported evidence is more consistent with the view that Saudi investors do not have any incentive to liquidate their holdings in loss firms.

In sum, it appears that the publication of accounting earnings in newspapers does not provide decision-relevant information that will cause significant revision to the *market* assessment of the future cash flows of Saudi firms. On the other hand, it appears that the publication of accounting earnings provides decision-relevant information that leads *individual* investors to revise their security holdings. However, this evidence is limited to cases where firms reported profit. It appears that reported losses do not lead Saudi investors to revise their security holdings, mostly because of the lack of any tax incentive for holders of investments in loss firms.

4.3. The timeliness of accounting earnings in Saudi Arabia

The left-hand side of Table 5 presents the empirical results for the regression outlined in Eq. (3) for the total sample. To ensure that the inferences made are not affected by any inefficiency caused by heteroscedasticity, all *t* statistics are calculated after correcting for the heteroscedasticity in the manner described by White (1980). The regression using the pooled sample yields an estimated coefficient for earnings levels of 1.31 (significant at the 1% level) and earnings changes of 0.302 (insignificant at conventional levels). The yearly

Table 5
Regression of annual security returns on earnings and earnings changes

$$\text{Ret}_{i,t} = \alpha + \beta_1(E_{i,t}/P_{i,t-1}) + \beta_2(\Delta E_{i,t}/P_{i,t-1}) + \varepsilon_{i,t}$$

Total sample					Total sample excluding electricity companies				
Year	α	β_1	β_2	Adjusted R^2	Year	α	β_1	β_2	Adjusted R^2
Pooled	.028	1.310***	0.302	.226	202 Pooled	-.030	1.939***	0.156	.345
1996	.011	1.350***	0.174	.380	50 1996	-.021	1.600***	0.166	.408
1997	.197***	1.067***	-1.105*	.226	51 1997	.116***	1.822***	-1.090**	.458
1998	-.191***	0.124	0.563	-.016	51 1998	-.270***	1.419***	0.173	.352
1999	.141***	2.128***	-0.250	.485	47 1999	.104**	2.771***	-0.634	.485

E: earnings per share scaled by beginning-of-period price.

ΔE : changes in earnings per share scaled by beginning-of-period price.

Ret: annual security returns.

* White-based significant at the 10% level.

** White-based significant at the 5% level.

*** White-based significant at the 1% level.

coefficients for earnings levels are also significant in every year, except 1998. On the other hand, none of the yearly coefficients for earnings changes is significant at the 5% level. The adjusted R^2 statistics are quite high in every year, except 1998.

The right hand side of Table 5 presents the empirical results for the same regression after excluding all Saudi electricity companies. These observations are excluded for two reasons. First, during December 1998, the Saudi government outlined a plan to merge all electricity companies. The announcement of this plan positively affected the raw security returns of these firms during 1998 and 1999. Second, the Saudi government has consistently provided generous subsidies to all electricity companies and, especially, during periods of reported losses. During 1998, all of the electricity companies reported significant losses, yet their raw security returns were positive (even after adjusting for market returns), possibly reflecting a view that the reported losses will be covered by governmental subsidies.

The adjusted R^2 from the pooled regression is 34.5% compared with the adjusted R^2 of 22.6% from the equivalent regression for the total sample. For the year-by-year regressions, the adjusted R^2 statistics are a great deal higher than those for the total sample, including 1998. The regression using the pooled sample yields an estimated coefficient for earnings levels of 1.94 (significant at the 1% level) and earnings changes of 0.156 (insignificant at conventional levels).⁷

We examine whether the timeliness of accounting earnings is affected by the degree of governmental ownership. We split our sample into two groups: the first group (Group A) includes 18 firms where governmental ownership equals or exceeds 20% and the second group (Group B) includes 34 firms where governmental ownership is below 20%. Group A includes all electricity companies as well as certain banks and most cement companies, among others. The adjusted R^2 for the regression outlined in Eq. (3) for Group A is 12% and the adjusted R^2 for the same regression for Group B is 39.2%. This evidence is consistent with our view that the degree of timeliness of accounting earnings is driven by the proportion of ownership by the Saudi government.

Table 6 presents the empirical results for the regression of contemporaneous returns on earnings levels and changes, as outlined in Eq. (3), for 2- and 5-year pooled data for the total and for the reduced samples (after excluding the electricity group). Given the observed influence of the electricity group on the reported findings of the annual regressions, the discussion of the estimates reported in Table 6 focuses solely on those for the reduced sample.

Table 6 shows that the adjusted R^2 statistic obtained from the pooled regression for the 2-year return interval is 63%. For the two samples of 2-year return intervals, the average value of the adjusted R^2 statistics is 59.3%. These adjusted R^2 statistics are significantly larger than that obtained for the pooled annual regression (34.5%) and the mean adjusted R^2 for the individual annual regressions (42.57%). Clearly, these statistics suggest that doubling the measurement interval significantly improves the association between earnings levels and security returns. Table 6 further indicates that the adjusted R^2 obtained from the pooled earnings level regression for the 5-year return interval is 73.7%, which is

⁷ We conduct the same empirical test after controlling the effect of the scale variable $\{1/P_{i,t-1}\}$ by including it as an additional explanatory variable. In fact, the findings do not reveal any major differences compared with the original tests.

Table 6

Regression of security returns on earnings and earnings changes (2- and 5-year analysis)

$$\text{Ret}_{i,t} = \alpha + \beta_1(E_{i,t} - P_{i,t-1}) + \beta_2(\Delta E_{i,t} - P_{i,t-1}) + \varepsilon_{i,t}$$

Total sample					Total sample excluding electricity companies					
Year	α	β_1	β_2	Adjusted N R^2	Year	α	β_1	β_2	Adjusted N R^2	
2- Year— pooled	.073**	1.306***	0.368	.394	99 2 Yearly— pooled	-.056	2.047***	0.333	.629	91
1996–1997	.175***	1.319***	0.209	.462	51 1996–1997	.050	1.839***	–0.029	.645	47
1998–1999	.031	0.721**	1.986*	.234	47 1998–1999	-.171***	2.492***	–0.129	.542	43
5 Year	.141	1.728***	1.381	.575	47 5-yearly	-.379***	2.237***	1.402	.737	43

E: earnings per share scaled by beginning-of-period price.

 ΔE : changes in earnings per share scaled by beginning-of-period price.

Ret: annual security returns.

* White-based significant at the 10% level.

** White-based significant at the 5% level.

*** White-based significant at the 1% level.

significantly larger than the adjusted R^2 obtained for the pooled 2-year earnings level regression (63%).⁸

Clearly, these statistics suggest that increasing the measurement interval significantly improves the association between earnings and security returns of Saudi firms. This evidence is consistent with the proposition of Easton et al. (1992) that “errors” in aggregate earnings are likely to become less important for longer periods of aggregation.

All of the reported adjusted R^2 statistics are comparable with those reported in the United States (see, e.g., Easton & Harris, 1991; Easton et al., 1992) and suggest that reported earnings by Saudi firms are timely in that they reflect current period economic income as proxied for by security returns. The closeness of the reported statistics for the individual coefficients and for the adjusted R^2 to those reported in the United States indicates that Saudi investors do not appear to be discounting the reported earnings figures.

4.4. The differential implications of positive and negative earnings on the relationship between earnings and security returns of Saudi firms

Table 7 presents a breakdown of the annual frequency and percentage of loss-reporting firms in Saudi Arabia during the sample period 1995–1999. It is clear that the incidence of

⁸ We check for the impact of dirty surplus items in the owner-equity section of Saudi companies by reviewing all the hard copies of the financial statements of our sample during the period 1995–1999. Indeed, we find that the owner-equity section of Saudi firms does not include dirty surplus items that can violate the clean surplus assumption. In other words, Saudi firms account for dirty surplus items in their income statements. This finding reveals that net income (earnings after zakat and income tax) is identical to the comprehensive income of all our sample firms. Furthermore, we conduct the same empirical tests after substituting the “earning before Zakat and income tax” with “comprehensive income” to examine the affect of using “comprehensive income” as the earnings variables. The empirical results were identical to these reported using earnings before Zakat and income tax as the proxy for earnings.

Table 7
Frequency of losses

Year	No. of Firms	No. of loss	% of loss
1995	52	12	23.00
1996	52	14	26.90
1997	52	10	19.20
1998	52	14	26.90
1999	48	14	29.10
All years	256	64	25.00

loss is quite common in Saudi Arabia in that it ranges from 19.2% in 1997 to 29.1% in 1999.

As can be seen in Table 8, the adjusted R^2 statistic for the earnings level and the earnings change model for all firms is 22.6%. When loss-reporting firms are excluded, the adjusted R^2 statistic increases from 27% to 28.7%. The adjusted R^2 statistic based exclusively on loss-reporting firms is only 3.5%. This pattern is consistent with that reported in a U.S. context (see, e.g., Hayn, 1995). Hayn (1995) notes that losses are likely to be considered temporary because shareholders can always liquidate their investments in the firm rather than suffer from indefinite losses. This argument assumes that losses are likely to be recurring and/or have tax consequences. Hayn uses a time series analysis to show a constant decline in adjusted R^2 statistics as the frequency of losses for a given firm increases. Given the limited data in the Saudi context, time series analysis is not feasible. Accordingly, we examine this issue by observing the adjusted R^2 statistics for four different subgroups constructed on the basis of the sign of reported earnings as well as the sign of the reported change in earnings.

As can be seen in Table 8, in firms that report a profit as well as a positive increase in earnings, the adjusted R^2 statistic increases to 29.6%. For firms that report a profit accompanied by a decrease in earnings, the adjusted R^2 statistic drops to 20.1%. Interestingly, for firms that report a loss and a decrease in earnings, the adjusted R^2 statistics increases to 30.9%. While our tests differ in form from those conducted by Hayn

Table 8

Adjusted R^2 statistics based on regression of security returns on earnings and earnings changes (profit and loss analysis)

$$Ret_{it} = \alpha + \beta_1(E_{it}/P_{it-1}) + \beta_2(\Delta E_{it}/P_{it-1}) + e_{it}$$

Reported earnings	Changes in earnings	N	Adjusted R^2 (%)
Profit	Positive and negative	152	28.70
Profit	Positive only	88	29.60
Profit	Negative only	64	20.10
Loss	Positive and negative	50	3.50
Loss	Positive only	19	0.00
Loss	Negative only	31	30.90
All observations		202	22.60

E: earnings per share scaled by beginning-of-period price.

ΔE : changes in earnings per share scaled by beginning-of-period price.

Ret: annual security returns.

(1995), this evidence may reflect the “lack of tax incentive” argument noted earlier rather than the “liquidation option” argument as noted by Hayn.

4.5. Conservatism in accounting earnings in Saudi Arabia

We define conservatism in the sense of Basu (1997) as the extent to which current period accounting earnings asymmetrically incorporate economic losses, relative to economic gain. As can be seen in Table 9, the β_2 slopes for the total sample and for the reduced sample are significant for the annual, 2- and 5-yearly samples, suggesting that accounting earnings in Saudi Arabia exhibit a high sensitivity to economic income. In contrast, the incremental negative return slopes β_3 are consistently insignificant, suggesting that accounting earnings in Saudi Arabia exhibit low or no sensitivity to economic loss.

The lack of income conservatism in Saudi Arabia is consistent with results reported for other code-law countries (see Ball, Kothari et al., 2000; Ball, Robin et al., 2000). Thus, despite adopting Anglo-American GAAPs, Saudi firms do not appear to be fully adhering to them in practice. In fact, similar with the reporting system in Japan, one-time accounting write-offs are rare in Saudi Arabia. In addition, most Saudi firms do not report any pension liabilities or postretirement liabilities. Furthermore, the banking sector is known for not incorporating economic losses into reported income.

Similar with Ball, Robin et al. (2000), we interpret these results on the grounds that Saudi managers and auditors may have a low incentive to incorporate economic losses into accounting earnings due to a reduced market demand for accounting information, low levels of public debt, low expected costs arising from stockholder and creditor litigation, and weak monitoring by analysts and other stakeholders.

Table 9

Contemporaneous association between earnings and returns measuring the extent to which current period accounting earnings asymmetrically incorporates economic losses, relative to economic gain (annual, 2-, and 5-yearly intervals)

$$E_{i,t}/P_{i,t-1} = \alpha + \beta_1 RD_{i,t} + \beta_2 Ret_{i,t} + \beta_3 Ret_{i,t} RD_{i,t} + \varepsilon_{i,t}$$

Total sample					Total sample, excluding electricity companies				
Year	β_2	β_3	Adjusted R^2	N	Year	β_2	β_3	Adjusted R^2	N
Pooled—annual	0.197***	−0.060	.173	253	Pooled—Annual	0.160***	0.024	.239	233
Pooled 2-yearly	0.399***	−0.133	.407	99	Pooled 2-Yearly	0.289***	0.029	.621	91
5 Yearly	0.437***	−0.121	.583	47	5-yearly	0.329***	−0.013	.713	43

E : earnings per share scaled by beginning-of-period price.

Ret : security returns less mean sample return.

RD : a dummy variable equaling one if Ret is negative and zero otherwise.

*** White-based significant at the 1% level.

5. Concluding remarks

Motivated by the work of Ball, Kothari et al. (2000), Ball, Robin et al. (2000), this study provides empirical evidence on the decision relevance and timeliness of earnings in Saudi Arabia. We assess the ability of accounting earnings to convey decision-relevant information by examining the impact of earnings announcements on security returns and the trading volume of Saudi firms. We assess the timeliness of accounting earnings by examining the contemporaneous association between earnings levels, earnings changes, and security returns of Saudi firms over 1-, 2-, and 5-year intervals. The results of the empirical tests suggest that the publication of accounting earnings in Saudi Arabia is not decision relevant, but that earnings figures are timely in terms of their association with security returns over 1-, 2-, and 5-year intervals. The tests also show that positive and negative earnings have differential implications for the timeliness of accounting earnings. However, further tests show that this evidence is not consistent with the loss-liquidation argument (Hayn, 1995) and may potentially reflect the lack of tax incentives to liquidate investments in loss firms. Additional tests show that accounting earnings exhibit low sensitivity to economic losses consistent with the view that Saudi managers and auditors have low incentives to incorporate economic losses into accounting earnings in a timely manner.

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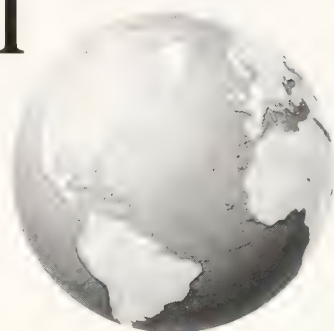
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Evidence on the efficacy of interest-rate risk disclosures by commercial banks

Anwer S. Ahmed^{a,1}, Anne Beatty^{b,2}, Bruce Bettinghaus^{c,*}

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Abstract

This paper documents evidence on the efficacy of maturity-gap disclosures of commercial banks in indicating their net interest income that is exposed to interest-rate risk. For the large sample of banks that filed call reports from 1990 to 1997, a period that includes a wide range of interest rate movements, we find that (i) one-year maturity gap measures are significantly related to the one-year-and three-years-ahead change in net interest income, (ii) fixed-rate and variable-rate instruments differ in explanatory ability, and (iii) the one-to-five-year aggregate gap measures also have some power in explaining three-year-ahead changes in net interest income. These findings hold after controlling for the ex post growth in assets as well as the amount of rate-sensitive assets and liabilities (a competing set of explanatory variables). Because the Securities and Exchange Commission (SEC)'s [Securities and Exchange Commission (SEC), (1997). *Disclosure of accounting policies for derivative financial instruments and derivative commodity instruments and disclosure of qualitative and quantitative information about market risk inherent in derivative financial instruments, other financial instruments, and derivative commodity instruments*. Release Nos. 33-7386; 3438223; IC-22487; FR-48; International Series No. 1047; File No. S7-35-95 (January 31, 1997). Washington, DC] tabular disclosures are finer than maturity-gap data, our findings mitigate concerns about the usefulness of the SEC's market-risk-disclosure requirements. Furthermore, they suggest contrary to the claims of certain banks that the omission of prepayment and early withdrawal risk from gap measures does not totally compromise the ability of gap data to indicate interest-risk exposures.

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Keywords: Maturity-gap disclosures; Interest-rate gap; Fixed-rate instruments; Rate-sensitive assets; Net interest income

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1. Introduction

In 1997, the Securities and Exchange Commission (SEC) issued Financial Reporting Release No. 48, *Disclosure of Accounting Policies for Derivative Financial Instruments and Derivative Commodity Instruments and Disclosure of Quantitative and Qualitative Information about Market Risk Inherent in Derivative Financial Instruments, Other Financial Instruments, and Derivative Commodity Instruments* (FRR 48). This mandate calls for market-risk disclosures in addition to financial statements to address widespread concerns about the adequacy of existing disclosures arising from the recent substantial increase in the use of instruments to sensitive market risk. FRR 48 states that while these instruments can be used as effective tools for managing exposures to market risk, they may lead to significant losses. Critics argue that investors may not only find the SEC's market-risk disclosures uninformative but may even be misled by them (see Culp & Miller, 1996; Lehn, 1997; Logan & Montgomery, 1997).

This paper provides indirect evidence on the efficacy of the SEC's tabular market-risk-disclosure requirements³ in indicating commercial bank interest-rate risk by examining the association between maturity-gap data disclosed in bank call reports and future changes in net interest income.⁴ We study maturity-gap data because they are very similar to the tabular format required in FRR 48. The release acknowledges, "gap analysis is a tabular disclosure approach which with minor additions would satisfy the tabular disclosure requirements" (FRR 48, Section VI, B, 2).

Our approach is motivated by a number of observations. First, Ahmed, Beatty, and, Takeda (1997) provide evidence that banks' risk-management policies focus on net interest income rather than market values. These policies are consistent with changes in net interest income that represent a significant risk for banks.⁵ Second, the change in net interest income impacts equity values both directly and through the persistence of earnings. The current focus on short-term earnings in setting prices makes this an important risk to measure (see for example Skinner & Sloan, 2002). Third, the risks of changes in income and equity value are separable (Toevs, 1983).⁶ Finally, the disclosure needed to inform about potential changes in net interest income can be reported in a single number (Toevs, 1983). This paper tests for and shows that a single, disclosed number, maturity gap, could be very informative about this important risk.

Once the decision to look at the risk of changes in net interest income has been made, bank-level data from call reports are a logical choice for the empirical setting to test this

³ FRR 48 requires firms to report their market risks in one of three formats: tabular, value at risk (VAR), or a sensitivity analysis. See Linsmeier and Pearson (1997) for a description of the three formats.

⁴ There is a related literature that examines the interest-rate sensitivity of stock returns following Flannery and James (1984). Examples include Hirtle (1997) and Schrand (1997). Rajgopal (1999) and Thornton and Welker (1999) use a stock-return-based approach in studying commodity price risk for oil and gas producers.

⁵ Barton (2001) provides evidence that firms' hedging decisions are related to earnings management.

⁶ Toevs (1983) demonstrates that the risk caused by unexpected changes in interest rates can be broken into two separate pieces. The first part of the risk is that from changes in net interest income over some "gapping" or risk-management period. The other portion of the risk is that of changes in the market value of bank capital, which is based on the market values of financial instruments that do not reprice or mature during the risk management period.

relationship. While the call reports do not allow us to test for the market values of bank capital because almost all of the reporting entities in the call reports are not publicly traded,⁷ the data provide a powerful setting to test for the relation between gap and future changes in net interest income. Gap data are readily available on a consistent basis for all banks that file call reports (8690 to 11,842 yearly observations for our sample). This is a much larger sample than the sample of firms for which the SEC's market-risk-disclosure data can be collected.

Another advantage of our approach is that the longer time-series data we examine cover periods of large increases as well as decreases in interest rates. Specifically, the annual average change in the one-year treasury rate ranges from -2.02% to 1.88% during our sample period.⁸ These changes in interest rates are quite large relative to those that have been observed over the last four decades. From 1955 to 1998, the largest negative change in the one-year treasury was -2.7% and the largest positive change was 2.73% .⁹

Although gap data have been available for many years, their usefulness is unclear. Hodder (2001) notes that the results of prior research on the association between gap data and the interest sensitivity of stock returns have been mixed. In addition, surveys conducted by the Financial Managers Society indicate a declining trend in the reporting of gap data (McGuire, 1998). This trend is motivated by the increasing acceptance of the view (forwarded by some bank managers) that gap is not a useful indicator of interest-rate risk exposures because (i) it is a static measure of exposure that does not capture growth or changes in the asset and liability mix, and (ii) it ignores options embedded in financial instruments. The extent to which these limitations compromise the association between gap data and changes in net interest income is an empirical question that has not been directly addressed in prior studies.

Our primary tests examine the relation between one-year-gap measures and the one-year-ahead change in net interest income. We are attempting to understand if, on average, the *ex ante* gap is helpful in predicting the future changes in net interest income. We focus on the one-year-ahead changes in net interest income because they are less likely to be affected by the static nature of the gap disclosures or the embedded options in financial instruments than are longer-run changes. We perform this analysis for each year in our sample separately and we perform a pooled analysis by interacting the one-year gap with the appropriate change in interest rate for each year. In addition to the one-year horizon tests, we also examine the relation between one-to-five-year gap measures and longer-horizon changes in net interest income three years ahead and five years ahead.

⁷ The unit of analysis in this paper is the bank; most of these banks are held by publicly traded bank holding companies. The bank holding company data is not as refined; a better measure of risk exposure can be constructed from the bank-level data.

⁸ We compute this variable by first finding each monthly value for the one-year change in the one-year rate, then averaging these monthly values for the year. This method is a better indicator of the impact of rate changes on instruments that reprice during the year. The rate change from January to December does not impact an instrument that has a life from July to June.

⁹ A more negative change in rate than in our sample period occurs in only three years: 1982, 1983, and 1985, and a more positive rate occurs in only five years: 1959, 1973, 1978, 1979, and 1981.

Using bank-level data from regulatory filings (call reports), we find strong evidence of a relation between both the fixed and variable rate one-year-on-balance-sheet maturity-gap and the one-year-ahead change in net interest income from 1990 to 1997. This result holds with or without controls for the ex post growth in assets,¹⁰ as well as for a competing set of explanatory variables (the amount of rate-sensitive assets and liabilities). Moreover, the coefficients on maturity-gap measures in the annual cross-sectional regressions are significantly positively correlated with interest-rate changes, although equality of the magnitude of the gap coefficients and interest-rate changes, which is implied by theory, is rejected at conventional levels. In our pooled analysis, we find that, with the exception of fixed-rate gap in periods of small interest-rate changes, these results hold for rate changes that are positive or negative, that are large or small, and whether the yield curve is flattening or steepening. We also find that the results hold regardless of whether the bank has interest rate derivatives, is growing rapidly or slowly, has high or low prepayment risk, or has high or low withdrawal risk.

We find that one-year-gap measures are also related to longer-term changes in income. In particular, even after controlling for the amount of rate-sensitive assets and liabilities, the one-year fixed- and variable-rate gap are significantly associated with the three-year-ahead change in net interest income in all years. The association between the three-year-ahead change in net interest income and the longer-term interest-rate gap is significant in only three of six years. Specifically, after controlling for both the one-year fixed- and variable-rate gap and the amount of rate-sensitive assets and liabilities, the one-to-five-year fixed-rate gap is significant in only one year, and the one-to-five-year variable-rate gap in only two out of six years. This is not surprising given that the longer the horizon, the more likely banks will change their asset/liability mix.

Our findings have several implications for the SEC's market-risk-disclosure requirements. First, given the similarity between the maturity-gap disclosures and the SEC's tabular disclosures, our findings mitigate concerns about the usefulness of SEC's tabular market-risk disclosures. Second, our finding of an incremental association between changes in net interest income and gap disclosures once the quantity of rate-sensitive instruments is controlled for suggests that gap disclosures may provide additional information beyond what is provided in the balance sheet. Third, the greater association between three-year-ahead changes in net interest income and one-year gap relative to one-to-five-year gap suggests that the SEC's finer disclosures may be useful. Fourth, the decline in the significance of gap measures for longer-horizon changes in interest income supports the SEC's focus on disclosure of *near-term* exposures. Fifth, the difference between the coefficients on fixed- and variable-rate instruments of gap supports the SEC's requirement for separate disclosure of these amounts. Sixth, the lower association between changes in interest-income and on-balance-sheet gap disclosures for derivative users suggests that the SEC's requirement that the effects of derivatives be incorporated in tabular disclosures may be useful. Furthermore, our findings suggest that the static nature

¹⁰ Net interest income changes are likely to be correlated with changes in assets. As we show in Section 3, the change in net interest income can be decomposed into a component related to gap and a component related to the ex post change in assets. Therefore, we include the ex post change in assets as a control variable. Our results are *not* affected by the one-year lagged asset growth ex post change in assets as a control variable.

of gap disclosures and the lack of disclosure about embedded options do not totally compromise the ability of gap to indicate banks' interest-rate risk exposures, contrary to claims made by some bank managers. Perhaps most importantly, all of the previous statements about our findings apply only to risk of changes in net interest income. What this implies is that while maturity gap is a good disclosure for this risk, it might not be the best disclosure for both the risk of changes in net interest income and the risk of changes in equity prices.

Our study has several limitations. First, gap disclosures in bank call reports do not reflect the impact of off-balance-sheet instruments. Despite this, we find that gap disclosures have predictive power for the subset of banks that use interest rate derivatives. Thus, incorporating off-balance-sheet instruments, as required by the SEC's market-risk-disclosure requirements, should result in even more useful risk disclosures. Second, we use a cross-sectional approach that ignores cross-sectional differences across banks (other than the characteristics that we explicitly control for). Thus, our results should be viewed as reflecting average effects across banks. Third, we focus on gap disclosures that are static and therefore ignore dynamic rebalancing of banks' positions. Studying dynamic adjustments may be a useful avenue for future research. Finally, although there are similarities between the regulatory gap measures and the SEC's tabular market-risk-disclosure requirements, there are also differences and thus our evidence provides indirect support for the SEC's disclosure requirements. Examining FRR 48 disclosures directly is another fruitful avenue for future research.

Section 2 provides a description of the SEC's 1997 market-risk-disclosure requirements. We analyze how maturity gap is related to changes in net interest income in Section 3. Section 4 outlines our research design. We describe our sample in Section 5. Empirical results are presented in Section 6 and the conclusion is provided in Section 7.

2. Background and description of disclosure requirements

In the 1990s, several corporate and noncorporate entities experienced substantial losses as a result of their market-risk positions. Public concern over these losses led the SEC to conduct a study during 1994 and 1995 to "(i) assess the quality of current disclosures about market risk sensitive instruments, (ii) improve the quality of those disclosures through the comment process, and (iii) determine what, if any, additional disclosures are needed to help investors better assess the market risk inherent in those instruments" (FRR 48, Section I). As part of this process, the SEC obtained comments from several private sector organizations. Among the recommendations received was one from the Federal Reserve Bank of New York that suggested that quantitative information about the overall market risk of an entity be required, and one from the Financial Executives Institute that suggested two distinct approaches to achieving that objective. "One approach is to provide a high-level summary of relevant statistics about outstanding activity in market risk sensitive instruments at period end. The second approach is to communicate the potential loss that could occur under specified condition using either value at risk or another comprehensive model for measuring market risk" (FRR 48, Section II).

The SEC determined that, although the reporting requirements under SFAS 119 improved disclosures in general, there were some remaining areas that needed improvement. One of those areas was the disclosure of aggregate market-risk exposures inherent in market-risk-sensitive instruments. Based on this assessment, in January of 1997, the SEC issued new rules that require disclosure of quantitative information about market risk. To provide flexibility that will “accommodate different types of registrants, different degrees of market risk exposure, and alternative ways of measuring market risk”, (FRR 48, Section II) the SEC allows three, alternative methods of disclosing this information about market risk. The three methods allowed are a tabular presentation, sensitivity analysis, and value at risk. In the subsections below, we compare and contrast the SEC’s tabular market-risk-disclosure requirements with the market-risk disclosures required by bank regulators in Regulatory call reports for on-balance-sheet and off-balance-sheet instruments, respectively.

2.1. Disclosure requirements for on-balance-sheet instruments

The SEC’s tabular format requires separate disclosures for financial instruments, in both trading and nontrading portfolios, of information sufficient to determine future cash flows from market-rate-sensitive instruments grouped by expected repricing or maturity dates. Thus, the SEC disclosure requirements allow managers to adjust contractual maturities for expected prepayments and withdrawals. This information should be provided for each of the next five years and for any remaining years in an aggregate amount. The market-rate-sensitive instruments should be grouped based on common characteristics. Specifically, separate disclosure should be made for interest-rate risk, foreign currency exchange rate risk, and commodity risk. Instruments that are subject to interest-rate risk should be separated into those that are fixed rate versus those that are variable rate.

Similar to the SEC requirements, the bank regulatory reports for the period between 1989 and 1996 require that data for nontrading instruments be reported separately and require separate reporting for fixed- versus variable-rate instruments. However, the maturity buckets required for regulatory reporting purposes are somewhat different from those required by the SEC. Specifically, in the regulatory reports, banks must disclose assets and liabilities maturing in 90 days or fewer, between 90 days and one year, between one year and five years, and over five years. Therefore, the two categories that are required by both the SEC and bank regulators are the less than one-year category and the over five-year category. The intermediate categories between one and five years required by the SEC cannot be reconstructed using the regulatory data. In addition, for regulatory reporting purposes, the contractual repricing or maturity date is used rather than the expected date considering prepayments and withdrawals.

2.2. Disclosure requirements for off-balance-sheet instruments

The SEC’s disclosure requirements for off-balance-sheet instruments are similar to the SEC’s disclosure requirements for on-balance-sheet instruments. In addition, the SEC

requires receive fixed/pay variable interest rate swaps to be reported separately from receive variable/pay fixed interest rate swaps.

The disclosures related to off-balance-sheet instruments required by bank regulators during this period are not as extensive as what is required by the SEC. Swaps are the primary off-balance-sheet instrument used by banks to manage interest-rate risk. Beginning at the end of 1989, banks were required to report the notional value of swaps maturing in less than one year and the amount maturing in more than one year. However, the swaps are not separated by fixed rate versus variable rate and they are not separated into trading and nontrading portfolios. Furthermore, with respect to other derivatives, bank regulators require disclosure of notional values only. Therefore, the regulatory disclosures are likely to be less informative about changes in net interest income for swap users than the disclosures required by the SEC.

3. The relation between interest-rate gap and future changes in net interest income

In this section, we discuss the association between interest-rate gap and changes in net interest income. First, we illustrate the theoretical relation between the interest-rate gap measures and changes in net interest income for variable-rate instruments. Next, we show that given certain assumptions, the relation between gap and changes in net interest income is similar for fixed- and variable-rate instruments. Finally, we discuss reasons why these theoretical relations between variable- and fixed-rate gap and changes in net interest income may not hold empirically.

3.1. Relation between future changes in net interest income and gap with only variable-rate instruments

To see how the gap is related to the one-year-ahead change in net interest income for a bank that only holds variable-rate instruments, consider a bank that has variable-rate-sensitive instruments that reprice in one year, between one and five years, and in more than five years. For simplicity, assume that the bank acquired these instruments at the beginning of year t , that no instruments mature or are purchased or sold for two years, that assets and liabilities have the same interest rate, and that all repricing occurs in unison. With these assumptions, the net interest income for years t and $t+1$ are as follows:

$$NII_{(t)} = r_{(t,1)}^I \text{GAP}_{(t,1)}^I + r_{(t,1-5)}^I \text{GAP}_{(t,1-5)}^I + r_{(t, >5)}^I \text{GAP}_{(t, >5)}^I \quad (1)$$

$$NII_{(t+1)} = r_{(t+1,1)}^I \text{GAP}_{(t,1)}^I + r_{(t,1-5)}^I \text{GAP}_{(t,1-5)}^I + r_{(t, >5)}^I \text{GAP}_{(t, >5)}^I \quad (2)$$

where $NII_{(t)}$ = net interest income for year t ; $r_{(t,M)}^I$ = interest rate at the beginning of year t on variable-rate instruments repricing in years; and $\text{GAP}_{(t,M)}^I$ = difference between variable-rate assets and liabilities that reprice within M years that were acquired in year t .

The change in net interest income from year t to year $t+1$ is:

$$\Delta \text{NII}_{(t+1:t)} = \text{NII}_{(t+1)} - \text{NII}_{(t)} = r_{(t,1)}^F \text{GAP}_{(t,1)}^F + r_{(t,1-5)}^F \text{GAP}_{(t,1-5)}^F + r_{(t,>5)}^F \text{GAP}_{(t,>5)}^F \\ - \left(r_{(t-1,1)}^F \text{GAP}_{(t-1,1)}^F + r_{(t-1,1-5)}^F \text{GAP}_{(t-1,1-5)}^F + r_{(t-1,>5)}^F \text{GAP}_{(t-1,>5)}^F \right)$$

This reduces to:

$$\Delta \text{NII}_{(t+1:t)} = \left(r_{(t+1,1)}^F - r_{(t,1)}^F \right) \text{GAP}_{(t,1)}^F \quad (3)$$

Thus, under these assumptions, the change in net interest income from period t to $t+1$ will equal the change in the one-year variable interest rate multiplied by the one-year GAP at the beginning of year t . Eq. (3) illustrates assumptions under which there should be a perfect correlation between variable-rate gap repricing in one year and changes in one-year-ahead net interest income. In this equation, instruments repricing in more than one year will not affect the one-year-ahead change in net interest income.

The relation between longer-run changes in net interest income and gap will depend on the extent to which instruments reprice in each year. For example, if all instruments that reprice in one to five years reprice in three years and we assume no maturities, sales, or purchases within three years, then:

$$\Delta \text{NII}_{(t+3:t)} = \left(r_{(t+3,1)}^F - r_{(t,1)}^F \right) \text{GAP}_{(t,1)}^F + \left(r_{(t+3,1-5)}^F - r_{(t,1-5)}^F \right) \text{GAP}_{(t,1-5)}^F$$

Without more refined gap data, it is difficult to predict what the exact relation will be between further-ahead changes in net interest income and gap.

3.2. Relation between future changes in net interest income and gap with only fixed-rate instruments

To see how the gap is related to the one-year-ahead change in net interest income for a bank that only holds fixed-rate instruments, consider a bank that has fixed-rate-sensitive instruments that mature in one year, between one and five years, and in more than five years. As for our variable rate instrument example, we assume that the bank acquired these instruments at the beginning of year t , that no instruments are purchased or sold for two years, that assets and liabilities have the same interest rate, and that all maturity occurs in unison. Furthermore, we assume that when instruments mature, they are replaced with the same quantity of instruments with the

same original maturity.¹¹ With these assumptions, the net interest income for years t and $t+1$ are as follows.

$$NII_{(t)} = r_{(t,1)}^F \text{GAP}_{(t,1)}^F + r_{(t,1-5)}^F \text{GAP}_{(t,1-5)}^F + r_{(t,>5)}^F \text{GAP}_{(t,>5)}^F \quad (4)$$

$$NII_{(t+1)} = r_{(t+1,1)}^F \text{GAP}_{(t,1)}^F + r_{(t,1-5)}^F \text{GAP}_{(t,1-5)}^F + r_{(t,>5)}^F \text{GAP}_{(t,>5)}^F \quad (5)$$

where $NII_{(t)}$ = net interest income for year t ; $r_{(t,M)}^F$ = interest rate at the beginning of year t on fixed-rate instruments maturing in M years; and $\text{GAP}_{(t,M)}^F$ = difference between fixed-rate assets and liabilities that mature within M years that were acquired in year t .

The change in net interest income from year t to year $t+1$ is:

$$\begin{aligned} \Delta NII_{(t+1,t)} = NII_{(t+1)} - NII_{(t)} = & r_{(t,1)}^F \text{GAP}_{(t,1)}^F + r_{(t,1-5)}^F \text{GAP}_{(t,1-5)}^F + r_{(t,>5)}^F \text{GAP}_{(t,>5)}^F \\ & - \left(r_{(t+1,1)}^F \text{GAP}_{(t,1)}^F + r_{(t,1-5)}^F \text{GAP}_{(t,1-5)}^F + r_{(t,>5)}^F \text{GAP}_{(t,>5)}^F \right) \end{aligned}$$

This reduces to:

$$\Delta NII_{(t+1,t)} = \left(r_{(t+1,1)}^F - r_{(t,1)}^F \right) \text{GAP}_{(t,1)}^F \quad (6)$$

Thus, under these assumptions, the change in net interest income from period t to period $t+1$ will equal the change in the one-year interest rate multiplied by the one-year GAP at the beginning of year t .

3.3. Theoretical versus empirical relation between changes in net interest income and gap

Eqs. (3) and (6) illustrate assumptions under which there should be a perfect correlation between both fixed-rate and variable-rate gap maturing or repricing in one year and changes in one-year-ahead net interest income. In each of these equations, the slope coefficient on the one-year GAP variable will equal the change in one-year interest rates earned in year $t+1$ relative to year t . In these equations, assets and liabilities either repricing or maturing in *more* than one year are irrelevant to the change in the one-year-ahead net interest income.¹²

¹¹ If we do not assume that the proceeds from maturities are reinvested, then the size of the bank will change, and correspondingly, net interest income will change. No reinvestment does not seem like a reasonable assumption.

¹² With regards to risk of net interest income, Toevs (1983) defines all rate-sensitive assets as "those that experience contractual changes in interest rates during the gapping period". He also states that the normal gapping period is one year.

Several complexities are not considered in deriving the previous equations that may reduce the observed correlation between one-year gap and one-year-ahead changes in net interest income.¹³ First, these equations do not allow for changes in the mix of financial instruments held and do not consider the effects of future growth. Second, the actual maturity or repricing within the time periods may vary widely. For example, within the group of financial instruments that mature or reprice within one year, there could be a several-month difference when the assets versus the liabilities mature or reprice. Third, variable-rate instruments could be linked to different indices that do not move in tandem. For example, some financial instruments repricing within one year might be linked to the prime rate while others might be linked to the LIBOR rate. Furthermore, the instruments may have embedded options, like prepayment options, that change their effective maturity or repricing. The effect of loan prepayments is to increase the dollar value of assets maturing within one year and thus to increase the one-year gap. Thus, in periods of significant decreases in interest rates, gap may understate the true position of the bank. Similar to prepayment risk, banks face early withdrawal risks in periods of increasing interest rates. The withdrawals are induced by the attractiveness of higher rates on deposits. The effect of early withdrawals is to increase the magnitude of liabilities maturing within one year. Therefore, the reported gap may overstate the true gap in periods of increasing interest rates. To the extent that managers can predict the effects of these embedded options, the SEC tabular disclosures—which account for management's expectation in contrast to call report gap disclosures, which do not—will not suffer from problems related to prepayments. Because prepayments and withdrawals depend on changes in interest rates, they may be difficult to predict.

When we compare Eqs. (3) and (6), we see that the only theoretical difference in the relation between changes in net interest income and gap for fixed- versus variable-rate instruments arises from potential differences in the change in the one-year variable rate versus the one-year fixed rate. In deriving these equations, we assumed that both the variable- and fixed-rate instruments were acquired in the previous year. Without this assumption, differences in the change in variable versus fixed rates are likely to occur because the change in the effective rate on fixed-rate instruments will be the change in the rate from the time the instrument was acquired, while the change in the rate on the variable-rate instruments will be the change in the rate since the last repricing date. It is likely that the fixed-rate instruments will have rate changes over a one-year or greater horizon, while the variable-rate instruments will have a less than one-year horizon. Furthermore, the empirical complexities not considered in deriving Eqs. (3) and (6) may cause additional differences in this relation for fixed- versus variable-rate instruments. We expect that this would be particularly true if the makeup of the fixed- and variable-rate gap components differ.

While the preceding discussion only relates to interest-rate risk and the financial instruments that give rise to that risk, many of the features of our models will translate to commodity and foreign exchange risk, as well as derivatives of all of these risks. The important research question we are interested in is does the financial reporting of these risks inform about the future income that is derived, based on current positions in risky assets and liabilities.

¹³ Survey data in McGuire (1998) suggests a decrease in the number of banks reporting gap data in their annual reports because of these alleged limitations.

4. Research design

4.1. Association between one-year-ahead changes in net interest income and gap

To test whether gap disclosures are associated with one-year-ahead changes in net interest income, despite empirical complexities that may weaken this theoretical relation, we estimate the following model based on Eqs. (3) and (6):

$$\Delta \text{NII}_{(t+1,t)} / \text{Assets}_{(t)} = \alpha + \beta_1^F \text{GAP}_{(t,M)}^F / \text{Assets}_{(t)} + \beta_1^V \text{GAP}_{(t+1)}^V / \text{Assets}_{(t)} + \gamma_1 (\text{Assets}_{(t+1)} - \text{Assets}_{(t)}) / \text{Assets}_{(t)} + \varepsilon \quad (7)$$

where $\Delta \text{NII}_{(t+1,t)}$ = net interest income for year $t+1$ less net interest income for year t ; $\text{GAP}_{(t,M)}^F$ = difference between fixed-rate assets and liabilities that mature within M years that were acquired at the end of year t ; $\text{GAP}_{(t,M)}^V$ = difference between fixed-rate assets and liabilities that reprice within M years that were acquired at the end of year t ; and $\text{Assets}_{(t)}$ = total assets at the end of year t .

We include an intercept term in our regression model to capture misspecifications due to empirical complexities not captured in the theoretical model. To the extent that omitted factors are uncorrelated with our gap variables, the coefficients on the gap variables will be unaffected by their omission and the intercept term will capture the effect of these omissions. We also include an asset-growth variable to capture changes in bank size. In sensitivity tests, we examine other possible proxies for growth, including growth in net rate-sensitive assets as well as the lagged growth in total and net rate-sensitive assets. None of these substitutions make a material change in test results.

We expect the sign of the coefficient on the one-year variable-rate GAP variable in Eq. (7) in any given year should be the same as the sign of the average change in the one-year interest rate, because the weighted average repricing of variable rate instruments is slightly less than one year. We expect the sign of the coefficient on the one-year fixed-rate GAP variable in Eq. (7) in any given year should be the same as the sign of the average change in the two-year interest rate, given a weighted average maturity of fixed-rate instruments of two years. We test these predictions by estimating Eq. (7) for each year in our sample.

We further expect that the magnitude of the coefficients on the one-year GAP variables in Eq. (7) will be positively correlated with changes in the interest rates observed in the year. We test this prediction by examining the correlations between the coefficients from our annual estimations of Eq. (7) with the corresponding changes in interest rates for each period. The results from the previous tests are presented in Tables 2 and 4.

4.2. Incremental association between one-year-ahead changes in net interest income and gap

To further examine whether there is an incremental association between gap disclosures and one-year-ahead changes in net interest income beyond that provided

by the amount of rate-sensitive instruments, we estimate the following expanded version of Eq. (7):

$$\begin{aligned} \Delta \text{NII}_{(t+1,t)} / \text{Assets}_{(t)} = & \alpha + \beta_1^F \text{GAP}_{(t,1)}^F / \text{Assets}_{(t)} + \beta_1^L \text{GAP}_{(t,1)}^L / \text{Assets}_{(t)} \\ & + \gamma_1 (\text{Assets}_{(t-1)} - \text{Assets}_{(t)}) / \text{Assets}_{(t)} \\ & + \gamma_2 \text{Securities}_{(t)} / \text{Assets}_{(t)} + \gamma_3 \text{Loans}_{(t)} / \text{Assets}_{(t)} \\ & + \gamma_4 \text{T-Deposits}_{(t)} / \text{Assets}_{(t)} \\ & + \gamma_5 \text{D-Deposits}_{(t)} / \text{Assets}_{(t)} + \varepsilon \end{aligned} \quad (8)$$

where $\Delta \text{NII}_{(t+1,t)}$ = net interest income for year $t+1$ less net interest income for year t ; $\text{GAP}_{(t,M)}^F$ = difference between fixed-rate assets and liabilities that mature within M years that were acquired at the end of year t ; $\text{GAP}_{(t,M)}^L$ = difference between fixed-rate assets and liabilities that reprice within M years that were acquired at the end of year t ; and $\text{Assets}_{(t)}$ = total assets at the end of year t ; $\text{Securities}_{(t)}$ = total amount of investments in securities at the end of year t ; $\text{Loans}_{(t)}$ = total amount of loans at the end of year t ; $\text{T-Deposits}_{(t)}$ = total amount of time deposits at the end of year t ; $\text{D-Deposits}_{(t)}$ = total amount of demand deposits at the end of year t .

We expect the coefficients on the one-year gap variables to be the same in Eq. (8) as in Eq. (7) if there is information in the gap disclosures beyond what could be learned from merely knowing the balance-sheet amounts of rate-sensitive instruments. The results from these tests are presented in Tables 3 and 4.

4.3. Cross-sectional and time-series differences in the association between one-year-ahead changes in net interest income and gap

To examine whether the empirical association between gap and changes in interest income is closer to the theoretical one for certain interest-rate environments, we split our sample periods into those with positive versus negative interest-rate changes, those with large versus small absolute values of interest-rate changes, and those with steepening versus flattening yield curves. Although these differences in interest rate environment do not lead to theoretical differences in the association between gap and changes in net interest income, empirically they may lead to difference because they may be related to the empirical complexities that we have discussed. Specifically, these different interest rate environments may be related to changes in product mix, growth, or the extent of prepayments. These time-series comparisons, therefore, provide an alternative to the cross-sectional comparisons as a way of assessing the importance of these empirical complexities. Given our limited number of time-series observations, we test for differences between these groups using a pooled cross-sectional and time-series regression. Instead of using gap measures as independent variables, we use the product of our gap measures and the appropriate interest-rate changes to allow us to combine multiple years in a single regression. The results for this test are presented in Table 5.

We examine the importance of complexities not considered in deriving the theoretical relation between gap and changes in net interest income by examining whether the

correlation between the estimated coefficients from Eq. (7) and the changes in interest rates are lower for banks where these complexities are more pronounced. We first allow the coefficients to vary for those banks that hold any type of interest-rate derivative because these derivatives are not accounted for in our gap measures. Next, to assess problems that arise because of the static nature of gap, we compare high-versus low-growth banks, and banks that face higher risk or prepayment of fixed-rate loans, and those with a higher risk of early withdrawal of deposits. We count as a high-growth bank those whose total asset growth is above the median in each year of our sample (the cutoff ranged between 0.0323 in 1994 and 0.0682 in 1995). Banks whose ratio of fixed-rate loans with maturity greater than five-years-to-assets was above the median (0.0295) were identified as ones that have a higher risk of prepayment. Banks that had demand deposits to assets above the median (0.1186) were labeled as high risk of early withdrawal. The results for this test are presented in Table 6.

4.4. Association between three- and five-year-ahead changes in net interest income and gap

To examine the importance of longer-run gap disclosures, we examine the relation between one-to-five-year gap measures and both three- and five-year-ahead changes in net interest income. We examine the three-year change because that is the average maturity of financial instruments in the one-to-five-year gap measure and we examine the five-year change because it is the longest maturity in that measure. We examine these relations by estimating the following equations:

$$\begin{aligned} \Delta \text{NII}_{(t+3,t)} / \text{Assets}_{(t)} = & \alpha + \beta_1^F \text{GAP}_{(t,1)}^F / \text{Assets}_{(t)} + \beta_1^I \text{GAP}_{(t,1)}^I / \text{Assets}_{(t)} \\ & + \beta_1^F \text{GAP}_{(t,1-5)}^F / \text{Assets}_{(t)} + \beta_1^I \text{GAP}_{(t,1-5)}^I / \text{Assets}_{(t)} \\ & + \gamma_1 (\text{Assets}_{(t+1)} - \text{Assets}_{(t)}) / \text{Assets}_{(t)} + \varepsilon \end{aligned} \quad (9)$$

$$\begin{aligned} \Delta \text{NII}_{(t+1)} / \text{Assets}_{(t)} = & \alpha + \beta_1^F \text{GAP}_{(t,1)}^F / \text{Assets}_{(t)} + \beta_1^I \text{GAP}_{(t,1)}^I / \text{Assets}_{(t)} \\ & + \beta_1^F \text{GAP}_{(t,1-5)}^F / \text{Assets}_{(t)} + \beta_1^I \text{GAP}_{(t,1-5)}^I / \text{Assets}_{(t)} \\ & + \gamma_1 (\text{Assets}_{(t+1)} - \text{Assets}_{(t)}) / \text{Assets}_{(t)} + \gamma_2 \text{Securities}_{(t)} / \text{Assets}_{(t)} \\ & + \gamma_3 \text{Loans}_{(t)} / \text{Assets}_{(t)} + \gamma_4 (\text{T-Deposits}_{(t)}) / \text{Assets}_{(t)} \\ & + \gamma_5 (\text{D-Deposits}_{(t)}) / \text{Assets}_{(t)} + \varepsilon \end{aligned} \quad (10)$$

Theoretically, the coefficients on the gap variables in these equations should be similar to those in Eq. (7). However, we expect that the associations will become weaker for further-ahead changes in net income because the discrepancies between the theoretical

versus empirical relations are expected to be greater for the further-ahead changes. The results for these tests are presented in Tables 7, 8, and 9.

5. Sample and descriptive statistics

5.1. Sample

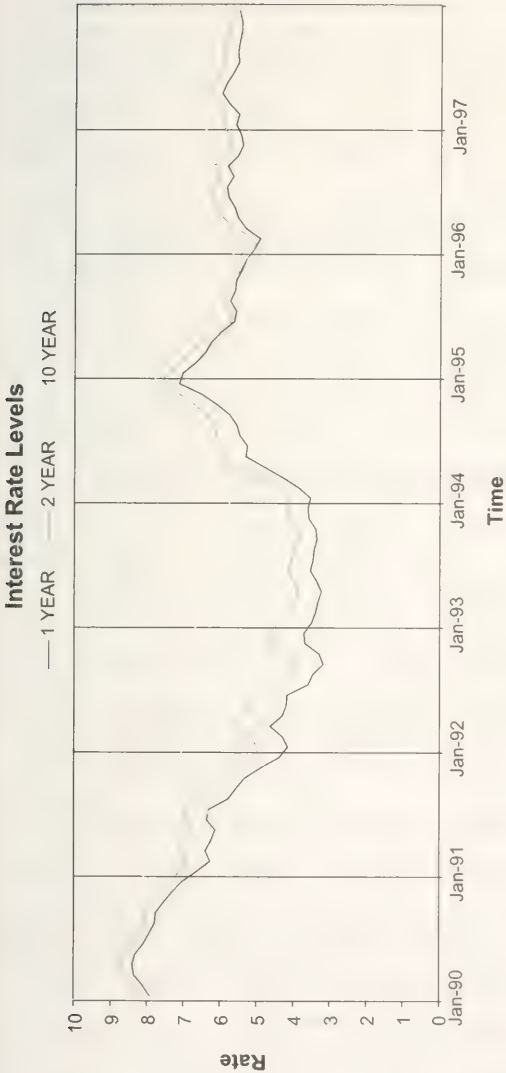
Our sample is drawn from all commercial banks that filed a Report of Condition and Income (call report) with the Federal Reserve, Federal Deposit Insurance Corporation, or Office of the Comptroller of the Currency from 1989 through 1997. We focus on this period because information about the maturity of fixed-rate instruments and the repricing frequency of variable-rate instruments was not required in the call reports prior to 1989. Furthermore, after 1996, maturities of fixed-rate instruments and repricing of variable-rate instruments were combined rather than reported separately.¹⁴

5.2. Descriptive statistics

Fig. 1 provides information about the levels and changes in interest rates that occurred during our sample period. The rates used in computing the changes are an average of the rate reported at the end of each month during the year. For each rate, the length of the change examined corresponds to the rate period; that is, we report the one-year change in the one-year rate, and the five-year change in the five-year rate. In six of the eight years, the sign of the interest-rate change is the same for both the one- and the two-year rates; in those years, we expect that the correlation between the one-year maturity gap and the one-year change in net interest income will be the same as the sign of the interest-rate changes. In two of the eight years, the signs on the interest-rate changes are not the same for the one- and two-year rates. In these years, we expect that the sign of the correlation between the maturity gap and the change in net interest income will depend on the original maturity or repricing of the securities. Because most variable instruments reprice within one year, we expect the sign of the correlation between gap and the change in net interest income to be the same as the sign of the change in the one-year rate for variable-rate instruments. The average, original maturity of the fixed-rate instruments is unknown, but it appears that for fixed-rate assets, it is longer than one year because of the persistent positive gap in the one-to-five-year maturity bucket. Therefore, we expect the sign of the correlation between gap and the change in net interest income to be the same as the sign of the change in the two-year rate for fixed-rate instruments.

Table 1 presents cross-sectional mean values of the one-year-ahead change in net interest income, change in total assets, one-year maturity gap measured at the beginning of the year (Total Gap), and its fixed- and variable-rate components for each year. All gap measures are based on contractual maturity or repricing dates. The beginning-of-the-year

¹⁴ We were able to provide evidence for 1997 because the gap measures used in the tests are based on the beginning-of-the-year gap positions.



Average change in interest rate by year								
	1990	1991	1992	1993	1994	1995	1996	1997
1 Year	-0.65	-2.02	-1.97	-0.46	1.88	0.64	-0.44	0.12
2 Year	0.06	-2.09	-3.39	-2.44	1.17	2.11	-0.10	-0.17
3 Year	0.59	-1.44	-3.25	-3.81	-0.55	0.96	1.55	-0.16
5 Year	-1.76	0.06	-1.75	-3.32	-1.82	-1.98	-1.19	0.03
Yield curve levels and changes								
Levels	0.67	2.00	3.12	2.44	1.77	0.63	0.93	0.72
Changes	0.70	1.33	1.12	-0.68	-0.67	-1.14	0.29	-0.20

Fig. 1. The yearly averages are the average of the 12 monthly observations for the 1-year change in the 1-year rate, the 2-year change in the 2-year rate, and so forth. We calculate the yield curve as the average of the monthly difference between the 10-year constant maturity rate and the 1-year constant maturity rate.

Table 1

	Year							
	1990	1991	1992	1993	1994	1995	1996	1997
<i>(A) Means of variables for total sample</i>								
One-year change in net interest income	0.0027	0.0032	0.0054	0.0024	0.0030	0.0030	0.0035	0.0041
One-year change in assets	0.0859	0.0690	0.0721	0.0618	0.0575	0.0953	0.0928	0.1001
One-year total gap	0.0514	0.0317	0.0438	0.0925	0.1330	0.1383	0.1194	0.0826
One-year fixed gap	-0.1420	-0.1631	-0.1533	-0.1171	-0.0883	-0.0955	-0.1125	-0.1288
One-year variable gap	0.1934	0.1949	0.1970	0.2095	0.2212	0.2337	0.2319	0.2114
Number of observations	11,842	11,465	11,125	10,695	10,189	9642	9178	8690
Three-year change in net interest income	0.0204	0.0134	0.0135	0.0112	0.0129	0.0143		
Three-year change in assets	0.4410	0.2587	0.2545	0.2866	0.3273	0.3765		
One-to-five-year, total gap	0.2599	0.2702	0.2792	0.2935	0.2991	0.3184		
One-to-five-year fixed gap	0.2513	0.2608	0.2683	0.2800	0.2830	0.2993		
One-to-five-year, variable gap	0.0086	0.0094	0.0109	0.0136	0.0162	0.0191		
Number of observations	10,856	10,485	10,081	9537	9023	8507		
<i>(B) Means of variables for the portion of the sample that does not use any type of interest-rate derivatives</i>								
One-year change in net interest income	N/A	0.0032	0.0054	0.0023	0.0030	0.0030	0.0035	0.0041
One-year change in assets	N/A	0.0695	0.0728	0.0609	0.0551	0.0950	0.0920	0.0984
One-year total gap	N/A	0.0272	0.0385	0.0867	0.1262	0.1313	0.1140	0.0773
One-year fixed gap	N/A	-0.1630	-0.1539	-0.1181	-0.0895	-0.0968	-0.1129	-0.1293
One-year variable gap	N/A	0.1903	0.1924	0.2048	0.2158	0.2281	0.2268	0.2066
Number of observations	N/A	10,994	10,646	10,219	9639	9166	8780	8360
Three-year change in net interest income	N/A	0.0132	0.0135	0.0110	0.0127	0.0140		
Three-year change in assets	N/A	0.2579	0.2515	0.2795	0.3188	0.3700		

Table 1 (continued)

	Year							
	1990	1991	1992	1993	1994	1995	1996	1997
<i>(B) Means of variables for the portion of the sample that does not use any type of interest-rate derivatives</i>								
One-to-five-year total gap	N/A	0.2725	0.2823	0.2968	0.3019	0.3221		
One-to-five-year fixed gap	N/A	0.2631	0.2713	0.2833	0.2857	0.3030		
One-to-five-year variable gap	N/A	0.0094	0.0110	0.0135	0.0162	0.0191		
Number of observations	N/A	10,087	9661	9147	8659	8221		
<i>(C) Means of variables for the portion of the sample that uses (any of) interest-rate swaps, interest-rate futures or forwards, or interest-rate options</i>								
One-year change in net interest income	N/A	0.0030	0.0056	0.0031*	0.0029	0.0034	0.0041	0.0049
One-year change in assets	N/A	0.0556*	0.0562*	0.0828**	0.1017**	0.0998	0.1108*	0.1424**
One-year total gap	N/A	0.1375**	0.1632**	0.2161**	0.2585**	0.2719**	0.2403**	0.2154**
One-year fixed gap	N/A	-0.1653	-0.1392*	-0.0952**	-0.0647**	-0.0710**	-0.1040	-0.1158
One-year variable gap	N/A	0.3028**	0.3024**	0.3113**	0.3232**	0.3429**	0.3443**	0.3312**
Number of observations	N/A	471	479	476	520	476	398	330
Three-year change in net interest income	N/A	0.0163*	0.0153	0.0154*	0.0185*	0.0208		
Three-year change in assets	N/A	0.2773	0.3218*	0.4540**	0.5303**	0.5621**		
One-to-five-year total gap	N/A	0.2124**	0.2085**	0.2173**	0.2330**	0.2108**		
One-to-five-year fixed gap	N/A	0.2019**	0.1984**	0.2021**	0.2171**	0.1928**		
One-to-five-year variable gap	N/A	0.0106	0.0101	0.0152	0.0158	0.0180		
Number of observations	N/A	398	420	390	364	286		

Variable definitions: change in net interest income (NII) is $NII_{it} - NII_{it-1}$ scaled by total assets at the beginning of the year (A_t). Change in assets (A) is $(A_{t-1} - A_t)/A_t$. Total gap is the difference between the total rate-sensitive assets and the total rate-sensitive liabilities maturing or repricing in less than one year. This is measured at the beginning of the year and scaled by A_t . Fixed gap is the difference between the fixed-rate-sensitive assets and the fixed-rate-sensitive liabilities maturing or repricing in less than one year. This is measured at the beginning of the year and scaled by A_t . Variable gap is the difference between the variable-rate-sensitive assets and the variable-rate-sensitive liabilities maturing or repricing in less than one year. This is measured at the beginning of the year and scaled by A_t .

N/A—The call reports do not contain information on interest-rate derivative holdings before 12/31/90.

* Indicates that value is significantly different for derivative users versus nonusers at the 5% level.

** Indicates that value is significantly different for derivative users versus nonusers at the 1% level.

total assets deflates each variable.¹⁵ For example, the 1990 mean one-year-maturity gap (0.05) is the one-year-maturity gap at the beginning of 1990 scaled by total assets at the same time. Similarly, the 1990 mean change in net interest income (0.0027) is the difference in net interest income for 1990 and 1989 scaled by total assets at the beginning of 1990.

The mean total gap ranges from a low of 3.2% of total assets in 1991 to 13.8% of total assets in 1995. The fixed gap positions of banks are on-average negative whereas the variable gap positions are on-average positive. The mean one-year variable and total gap for derivative users is significantly greater ($\alpha < .01$) than for nonusers in every year. This does not necessarily mean that derivative users have positions that are more speculative because their derivative positions potentially offset their on-balance-sheet positions (see Ahmed, Beatty, & Bettinghaus, 1999; Gorton & Rosen, 1995). The insignificant difference in the one-year change in net interest income between derivative users and nonusers in every year except 1993 is consistent with the derivative positions offsetting the on-balance-sheet gap.

The one-year-maturity-gap variable represents debt securities (such as Treasury Bills or Government bonds) and loans maturing in one year minus the time deposits, subordinated debt, and limited-life capital instruments maturing in one year. Total gap is the sum of fixed gap and variable gap. Thus, for 1990, the mean total gap of 5% consists of –14% fixed gap and 19% variable gap. The different signs on fixed-and variable-rate gap measures are driven by the differences in the level of fixed-rate time deposits compared to variable-rate time deposits. On average, the banks in our sample have 10% of their assets supported by fixed-rate time deposits maturing in less than one year, and only 0.2% of their assets supported by variable-rate time deposits maturing or repricing in less than one year. There are also differences on the assets side of the balance sheet. On average, the banks in our sample held 18.6% of their assets as variable-rate loans maturing or repricing in less than one year, while holding only 13.6% as fixed-rate loans maturing in less than one year.

We also present the mean values of variables used in our longer-term tests. For those banks that have three-year-ahead data, we present the three-year change in net interest income and the three-year change in assets, along with the total, fixed- and variable-gap measures in the one-to-five-year maturity bucket. All of these gap measures are positive, with the fixed-rate instruments being the major portion of the total gap, and the variable rate maturity gap being close to zero. Table 1, Panel A presents the descriptive statistics for the full sample, whereas Panels B and C present the descriptive statistics for banks that do not use interest-rate derivatives and banks that do, respectively. The magnitude of on-balance one-to-five-year fixed and total gap for derivative users is significantly ($\alpha < .001$) larger than for nonusers in each year. Again, this does not imply that derivative users have larger net gap positions, although the three-year change in net interest income is significantly ($\alpha < .05$) higher for derivative users than for nonderivative users in four of the five years examined. However, these are not independent observations, given the overlap in the measurement of the three-year change in net interest income.

¹⁵ As an alternative deflator, we used total rate-sensitive assets instead of total assets. The results are not sensitive to the choice of deflator.

Table 1 also shows that there is a general decline in the number of banks due to consolidation in the banking industry through mergers and acquisitions. Interestingly, despite this overall decline, there is an increase in the number of derivative users over the period 1991–1994.

6. Results

6.1. Relation between one-year-gap measures and one-year-ahead change in net interest income

Table 2 presents results for annual cross-sectional regressions with fixed- and variable-rate components of gap. We expect the sign of the coefficient on fixed gap to be consistent with the sign of the change in two-year interest rates and the sign of the coefficient on variable gap to be the same as the sign of the change in one-year rates. We find that in five out of eight years, the sign of the coefficient on fixed gap is the same as the sign of the two-year change in the two-year rates and is significant at the 0.01% level. The absolute value of the two-year interest-rate changes in these five years is the largest of the eight, with the smallest absolute change during these five years being more than six times larger than the largest absolute change in the three years when the coefficients are insignificant.

Table 2
Results of annual cross-sectional regressions for the full sample

	Year							
	1990	1991	1992	1993	1994	1995	1996	1997
Predicted sign on fixed gap	+	–	–	–	+	+	–	–
Predicted sign on variable gap	–	–	–	–	+	+	–	+
Intercept	0.0003 (2.48)	0.0013 (10.51)	0.0032 (23.89)	0.0003 (2.19)	0.0000 (0.21)	–0.0009 (–6.62)	0.0011 (7.52)	0.0006 (4.96)
Fixed gap	–0.0011 (–1.81)	–0.0068 (–9.30)	–0.0077 (–11.28)	–0.0016 (–2.10)	0.0039 (6.41)	0.0091 (14.86)	–0.0001 (–0.18)	–0.0000 (–0.06)
Variable gap	–0.0007 (–1.40)	–0.0053 (–7.06)	–0.0055 (–7.90)	0.0004 (0.64)	0.0069 (12.81)	0.0088 (16.61)	–0.0014 (–1.92)	0.0022 (2.84)
Change in assets	0.0284 (28.91)	0.0269 (31.07)	0.0297 (33.36)	0.0295 (32.91)	0.0307 (31.37)	0.0285 (31.50)	0.0294 (29.23)	0.0297 (27.74)
Adjusted R^2	.3053	.2540	.2850	.2671	.3355	.3127	.2834	.3377
χ^2 for Fix = Var	0.68	5.10	11.97	8.95	28.67	0.18	4.69	12.56
$\Pr > \chi^2$	(0.4111)	(0.0240)	(0.0005)	(0.0028)	(<0.0001)	(0.6685)	(0.0303)	(0.0004)
N	11,842	11,465	11,125	10,695	10,189	9642	9178	8690

The dependent variable in each panel is the one-year-ahead change in net interest income. The independent variables are the fixed and variable components of total gap and the change in total assets. Beginning-of-year total assets scales all variables. White-corrected t statistics are in parentheses, following the coefficient estimates. P values follow the f values for the f tests.

In six of eight years, the sign of the coefficient on variable gap is consistent with the average change in one-year rates and is significant at the 0.01% level.

Because the changes in rates on the fixed-rate instruments generally differ from changes in rates on variable-rate instruments (due to the differences in average maturity), we expect the coefficients on fixed gap and variable gap to differ. Table 2 shows the chi-squared test statistic and the associated significance levels for testing the equality of the coefficients on fixed gap and variable gap. The test statistics indicate that the equality is rejected at conventional levels in each year except 1990 and 1995. Therefore, decomposing total gap into fixed- and variable-rate components provides potentially useful information.

In theory, the coefficient on the gap measures should be equal to the change in the appropriate interest rates. This implies that, over time, changes in interest rates should be positively correlated with the coefficients on gap. To provide evidence on this prediction, we examine correlations between our estimated coefficients on gap measures and the magnitude of the various interest-rate changes. In Table 4, Panel A, we report the correlations between the interest-rate changes in Fig. 1 and the coefficients on the fixed- and variable-maturity gap from Table 2. The coefficients on fixed gap are most highly correlated with the average two-year change in the two-year rate, whereas the coefficients on variable gap are most highly correlated with the average one-year change in the one-year rate.

Overall, the evidence provides strong support for the hypothesis that one-year-gap measures are associated with one-year-ahead changes in net interest income across periods with different levels and signs of interest-rate movements.¹⁶

6.2. Usefulness of gap after controlling for the level of rate-sensitive assets and liabilities

The tests discussed above provide strong support for the hypothesis that gap measures are associated with future changes in net interest income after controlling for the ex post change in assets. However, they do not provide evidence on whether gap measures are incrementally useful after controlling for other potential explanatory variables of changes in net interest income, such as the level of rate-sensitive assets and liabilities. To see if one-year-gap measures are incrementally associated after controlling for the level of rate-sensitive assets and liabilities, we repeat our tests from Table 2 with the beginning-of-year demand deposits, time deposits, securities, and loans (all deflated by total assets) as additional explanatory variables. This information is publicly available and therefore is potentially useful in explaining changes in net interest income.

Table 3 provides evidence on the incremental usefulness of fixed- and variable-rate components of one-year gap. The coefficients on fixed-rate gap are significant at the 0.01% level, having the correct sign, in seven out of eight years. In 1990, the coefficient on the fixed-gap variable does not have the predicted sign. The coefficients on variable-rate gap also are significant at the 0.01% level, having the correct sign, in seven out of

¹⁶ We further examine the importance of differences in the association between gap and future changes in net interest income across different levels and signs of interest-rate movements in the sensitivity-analysis section below.

Table 3
Results of annual cross-sectional regressions for the full sample

	Year							
	1990	1991	1992	1993	1994	1995	1996	1997
Predicted sign on fixed gap	+	–	–	–	+	+	–	–
Predicted sign on variable gap	–	–	–	–	+	+	–	+
Intercept	0.0098 (4.06)	0.0041 (1.60)	– 0.0015 (– 0.62)	– 0.0022 (– 1.12)	0.0053 (3.77)	0.0056 (2.47)	0.0051 (2.67)	0.0054 (3.70)
Fixed gap	– 0.0034 (– 5.59)	– 0.0072 (– 9.94)	– 0.0081 (– 12.40)	– 0.0023 (– 2.63)	0.0032 (4.83)	0.0081 (11.79)	– 0.0018 (– 2.91)	– 0.0017 (– 2.13)
Variable gap	– 0.0034 (– 5.29)	– 0.0064 (– 7.78)	– 0.0075 (– 10.26)	– 0.0016 (– 2.10)	0.0062 (9.69)	0.0084 (13.28)	– 0.0038 (– 5.41)	0.0008 (1.06)
Change in assets	0.0274 (30.11)	0.0265 (33.22)	0.0293 (33.05)	0.0289 (32.03)	0.0302 (30.29)	0.0280 (30.05)	0.0286 (28.84)	0.0290 (26.80)
D-Deposits	– 0.0104 (– 3.56)	– 0.0161 (– 4.64)	– 0.0033 (– 1.06)	0.0023 (0.83)	0.0050 (2.65)	0.0056 (2.48)	– 0.0065 (– 2.84)	– 0.0023 (– 1.07)
T-Deposits	– 0.0129 (– 5.28)	– 0.0076 (– 2.66)	– 0.0017 (– 0.67)	0.0010 (0.37)	0.0022 (1.34)	0.0006 (0.28)	– 0.0073 (– 3.97)	– 0.0027 (– 2.20)
Securities	0.0001 (0.12)	0.0048 (4.09)	0.0056 (4.15)	– 0.0006 (– 0.62)	– 0.0101 (– 9.22)	– 0.0088 (– 4.83)	0.0002 (0.13)	– 0.0055 (– 3.83)
Loans	0.0033 (2.54)	0.0069 (5.43)	0.0096 (6.26)	0.0041 (2.71)	– 0.0078 (– 6.08)	– 0.0087 (– 4.50)	0.0045 (2.64)	– 0.0028 (– 1.78)
Adjusted R^2	.3259	.2775	.2984	.2756	.3516	.3250	.2957	.3426
χ^2 for Fix = Var	0.00	1.52	0.85	0.86	27.34	0.31	10.98	14.24
$\Pr > \chi^2$	(0.95239)	(0.2180)	(0.3577)	(0.3533)	(< 0.0001)	(0.5766)	(0.0009)	(0.0002)
N	11,842	11,465	11,125	10,695	10,189	9642	9178	8690

The dependent variable in each panel is the one-year-ahead change in net interest income. The independent variables are the fixed and variable components of total gap, change in total assets, and the amount of rate-sensitive financial instruments. Beginning-of-year total assets scales all variables. White-corrected t statistics are in parentheses, following the coefficient estimates. P values follow the f values for the f tests.

Variable definitions—In addition to the variables that are as defined in Table 1, the following variables are added: D-Deposits is the total value of demand deposits held at the beginning of the year and scaled by total assets. T-Deposits is the total value of time deposits held at the beginning of the year and scaled by total assets. Securities is the total amount of securities held at the beginning of the year and scaled by total assets. Loans is the total amount of total loans and leases held at the beginning of the year and scaled by total assets.

eight years. The coefficient is insignificant in 1997. An F test for the incremental explanatory power of the gap variables is rejected in every year. These results suggest that there is an incremental association between the gap variables and changes in net interest income after controlling for the amount of interest-sensitive instruments reported in the financial statements.

We also repeat the correlation tests to determine if the magnitude of the coefficients is consistent with the magnitude of the changes in interest-rate changes after the addition of the new control variables. In Table 4, Panel B, we report the correlations between the interest-rate changes in Fig. 1 and the coefficients on the total, fixed, and variable maturity gap from Table 3. These correlations are quite similar to those based on the Table 2

Table 4

	Chg1year	Chg2year
<i>(A) Pearson correlation coefficients between the coefficients on the one-year-gap variables from the model in Table 2 and the average changes in interest rates found in Fig. 1. There are eight observations in the sample and all correlations are significant at the < 0.01 level</i>		
Fixed gap	.8556	.9179
Variable gap	.9229	.8576
<i>(B) Pearson correlation coefficients between the coefficients on the one-year-gap variables from the model in Table 3 and the average changes in interest rates found in Fig. 1. There are eight observations in the sample and all correlations are significant at the < 0.01 level</i>		
Fixed gap	.8562	.8820
Variable gap	.9044	.8423

estimates. Both the one- and two-year changes in rates are significantly correlated with the coefficients.

Overall, the combination of Tables 3 and 4, Panel B, suggests that gap measures do have incremental explanatory power beyond the amount of rate-sensitive assets and liabilities.¹⁷

6.3. Cross-sectional and time-series differences in the association between changes in net interest income and gap

The tests reported above are based on annual cross-sectional regressions. An alternative specification is to use a pooled cross-sectional time-series regression with fixed-firm and time effects. Instead of using gap measures as independent variables, we use the product of gap measures and the appropriate change in interest rates as the independent variable. If the change in interest rates captures the true change in rates on the assets/liabilities that are maturing, then the coefficient on the product of gap measures and the appropriate change in interest rates should be equal to one in every period. By allowing us to combine all of the years being examined in a single regression model, this specification provides several advantages over the year-by-year analysis.

The motivation for this is threefold. First, this specification allows for a direct test of the extent to which the observed average changes in the respective interest rates capture the unobserved true changes in the relevant interest rates. Second, using this design, we can allow the coefficients to vary across different interest-rate environments and across

¹⁷ The tests discussed so far include both derivative users and nonusers. However, on-balance-sheet gap measures are unlikely to measure the true gap position of banks that use interest rate derivatives. Furthermore, other variables, such as notional or fair value of derivatives, might also be relevant in explaining changes in future net interest income for derivative users. Therefore, we repeat our tests for the subsample of banks that use interest-rate derivatives (results not tabulated). The short-term tests on just the sample of banks that hold any type of interest-rate derivative reveal a lower association between these banks' on-balance-sheet gap and future changes in net interest income. For the derivative users, the fixed-rate maturity gap is significant for only one out of seven years, while the variable rate gap is significant in three out of seven years. These findings lend support for the SEC's decision to include the effect of any interest-rate derivative holdings in the tabular market-risk disclosures.

different types of banks. Third, the combined regression will be more powerful than an individual annual regression, because the number of observations is roughly seven times greater than in any one of those regressions, and the use of fixed-firm effects allows us to control for potential bank-specific differences that cannot be controlled for in annual regressions, which allows us to deal directly with the issue that the annual regressions may not be independent.

We report the results of the pooled regressions that allow for differences in interest-rate environments in Table 5. The differing rate environments that we control for are rate changes that are positive or negative, and/or large or small, and whether the yield curve is flattening or steepening. We find that the coefficients on both the fixed- and variable-gap measures are significant and positive in all cases except for the fixed-gap measure when there is a small change in interest rates. The coefficient on the fixed-gap measure is significantly lower when changes in interest rates are small and when the yield curve is flattening. In contrast, the coefficient on the variable-gap measure is significantly higher when interest-rate changes are small. Although the coefficients are generally different from zero, we can consistently reject their equality to one.

We report the results of the pooled regressions that allow for differences across different types of banks in Table 6. The broad classes of cross-sectional differences we control for include whether the bank has interest-rate derivatives, is growing rapidly or

Table 5
Results of pooled cross-sectional, fixed-firm, and time-effects regressions

Intercept	0.0002 (5.69)	0.0002 (5.54)	0.0003 (6.58)	0.0002 (5.78)	0.0002 (4.64)
Fixed gap × Chg2year	0.2604 (24.96)	0.2584 (10.13)	0.2551 (24.26)	0.3135 (20.47)	0.4859 (11.92)
NEG fixed gap × Chg2year		0.0048 (0.15)			– 0.2122 (– 5.05)
SMALL fixed gap × Chg2year			– 0.7254 (– 2.81)		– 1.1009 (– 4.03)
FLAT fixed gap × Chg2year				– 0.1203 (– 5.54)	– 0.1433 (– 5.15)
Var gap × Chg1year	0.2961 (19.08)	0.2738 (10.53)	0.2886 (18.55)	0.3345 (13.03)	0.1539 (1.04)
NEG var gap × Chg1year		0.0360 (0.87)			0.2212 (1.43)
SMALL var gap × Chg1year			0.2928 (8.37)		0.3589 (8.75)
FLAT var gap × Chg1year				– 0.0611 (– 1.53)	0.0249 (0.18)
Change in assets	0.0227 (66.45)	0.0227 (66.48)	0.0227 (66.52)	0.0227 (66.59)	0.0227 (66.62)
Adjusted R ²	.1935	.1935	.1945	.1940	.1955

The number of observations for all models is 80,826. The dependent variable is the one-year change in net interest income. Independent variables are gap measures interacted with changes in interest rates. The fixed-firm effects are implemented by adjusting both the independent and dependent variables by the time-series mean for each bank to control for differences across banks. Fixed-effects year-dummies (which are not presented) are included to control for changes across time. The White-adjusted *t* statistics are in parentheses, following the coefficients. Coefficients in bold type are significant at a level of <0.10.

Table 6

Results of pooled cross-sectional, fixed-firm, and time-effects regressions

Intercept	0.0006 (10.54)	0.0006 (10.27)	0.0006 (10.01)	0.0006 (10.23)	0.0006 (10.37)
Fixed gap × Chg2year	0.2599 (23.57)	0.2807 (21.54)	0.2364 (16.08)	0.2500 (17.41)	0.2717 (16.07)
IRD × Fixed gap × Chg2year	– 0.0325 (– 0.48)				– 0.0315 (– 0.47)
GROW × Fixed gap × Chg2year		– 0.0604 (– 3.27)			– 0.0635 (– 3.35)
PREPAY × Fixed gap × Chg2year			0.0243 (1.31)		0.0297 (1.57)
WITHDRAW × Fixed gap × Chg2year				– 0.0021 (– 0.12)	0.0108 (0.60)
Var gap × Chg1year	0.3481 (21.61)	0.3427 (18.46)	0.3314 (15.23)	0.2989 (14.32)	0.3633 (15.26)
IRD × Var gap × Chg1year	– 0.2800 (– 4.90)				– 0.2707 (– 4.67)
GROW × Var gap × Chg1year		– 0.0465 (– 2.08)			– 0.0592 (– 2.62)
PREPAY × Var gap × Chg1year			– 0.0391 (– 1.77)		– 0.0202 (– 0.88)
WITHDRAW × Var gap × Chg1year				0.0322 (1.39)	0.0416 (1.80)
Change in assets	0.0226 (61.00)	0.0226 (59.52)	0.0226 (60.79)	0.0226 (60.53)	0.0227 (59.76)
Adjusted R^2	.1914	.1901	.1902	.1900	.1918

The number of observations for all models is 70,984 (this is smaller than Table 5 because the information on derivatives holdings is not available for 1990). The dependent variable is the one-year change in net interest income. Independent variables are gap measures interacted with firm-specific indicator variables. The four cross-sectional firm differences that we allow for are the following: derivatives holding, high growth, high risk of loan prepayment, and high risk of early withdrawal of deposits. The fixed-firm effects are implemented by adjusting both the independent and dependent variables by the time-series mean for each bank to control for differences across banks. Fixed-effects year-dummies (which are not presented) are included to control for changes across time. The White-adjusted t statistics are in parentheses, following the coefficients.

IRD is an indicator variable that is one when a bank holds any type of interest-rate derivative.

GROW is an indicator variable that is one when a bank is above the median growth rate in assets for the year. PREPAY is an indicator variable that is one when a bank's ratio of fixed-rate loans with maturity greater than five-years-to-assets is above the median.

WITHDRAW is an indicator variable that is one when a bank's ratio of demand-deposits-to-assets is above the median.

Coefficients in bold type are significant at a level of < 0.10 .

slowly, has high or low prepayment risk, or has high or low withdrawal risk. We find that the coefficients on both the fixed- and variable-gap measures are significant and positive in all cases. The coefficient on both the fixed- and variable-rate gap measures are significantly lower for banks that are growing faster. In addition, the coefficient on the variable-gap measure is significantly lower for banks with interest-rate derivatives. Again, as in the case of controlling for different interest-rate environments, the coefficients are generally different from zero; and we can consistently reject their equality to one.

6.4. Longer-horizon tests

Tables 2–4 focus on providing evidence on the usefulness of one-year-gap measures because the SEC's primary focus is on near-term exposures. The SEC also requires tabular disclosures for each of the next five years. Regulators do not require these disclosures. However, regulators require an aggregate disclosure of maturity gap between one to five years and greater than five years. We examine whether the one-to-five-year aggregate gap disclosures have explanatory power over two longer horizons—three years and five years.

Table 7 presents results of estimating Eq. (9). To obtain the correct sign of the coefficients on gap measures, we need to know the precise timing of the acquisition and maturity of assets and liabilities. The longer the horizon, the more difficult it becomes to determine the relevant interest-rate changes. Therefore, in the long-horizon tests, we focus on testing for the significance of the coefficients on the gap measures. In other words, we examine whether gap measures have any explanatory power, without respect to direction, but with respect to the longer-horizon changes in net interest income.

Table 7
Results of annual cross-sectional regressions for the full sample

	Year					
	1990	1991	1992	1993	1994	1995
Predicted sign on fixed gap 1–5 years	+	–	–	–	–	+
Predicted sign on variable gap 1–5 years	+	–	–	–	+	+
Intercept	– 0.0020 (– 0.58)	0.0034 (3.03)	0.0019 (2.24)	– 0.0011 (– 0.92)	– 0.0010 (– 0.81)	– 0.0077 (– 1.45)
Fixed gap, 1 year	– 0.0118 (– 6.35)	– 0.0140 (– 7.87)	– 0.0051 (– 3.77)	0.0102 (4.50)	0.0114 (4.76)	0.0192 (2.67)
Variable gap, 1 year	– 0.0081 (– 1.35)	– 0.0099 (– 4.52)	0.0028 (1.57)	0.0152 (2.44)	0.0057 (1.14)	0.0121 (1.45)
Fixed gap, 1–5 years	0.0145 (1.64)	0.0029 (1.33)	0.0026 (1.10)	– 0.0005 (– 0.09)	– 0.0041 (– 1.17)	0.0108 (1.84)
Variable gap, 1–5 years	0.0098 (1.76)	– 0.0001 (– 0.04)	– 0.0108 (– 3.27)	– 0.0098 (– 2.22)	– 0.0119 (– 1.74)	0.0025 (0.46)
Change in assets—3 years	0.0420 (419.74)	0.0343 (6.86)	0.0383 (23.71)	0.0371 (6.17)	0.0459 (8.27)	0.0472 (3.28)
Adjusted R^2	.9976	.7405	.8455	.6989	.8563	.6889
χ^2 for fix = Var	0.57	9.69	36.11	1.29	2.32	1.80
$\Pr > \chi^2$	(0.4510)	(0.0019)	(< 0.0001)	(0.2586)	(0.1275)	(0.1792)
χ^2 for Fix 1–5 = Var 1–5	0.97	0.95	13.69	12.13	1.53	1.52
$\Pr > \chi^2$	(0.3244)	(0.3299)	(0.0002)	(0.0005)	(0.2167)	(0.2182)
N	10,856	10,485	10,081	9537	9023	8507

The dependent variable in each panel is the three-year-ahead change in net interest income. The independent variables are the total gap for one year, the total gap for one to five years, and the change in total assets for three years. Beginning-of-year total assets scales all variables. White-corrected t statistics are in parentheses, following the coefficient estimates.

Table 7 shows that the fixed and variable components of one-year gap significantly explain the three-year-ahead change in net interest income in six out of six years. Furthermore, the one-to-five fixed-rate gap is significantly associated with the three-year-ahead change in net interest income in two out of six years and the one-to-five-year aggregate variable gap is associated with the three-year-ahead change in net interest income in four out of six years.

Table 8 presents the results of estimating Eq. (10). Table 8 shows that while the one-year fixed- and variable-rate gap components are significant in each year, the one-to-five-year fixed- and variable-rate gap components are significant in three out of six years.

Table 8
Results of annual cross-sectional regressions for the full sample

	Year					
	1990	1991	1992	1993	1994	1995
Predicted sign on fixed gap 1–5 years	+	–	–	–	–	+
Predicted sign on variable gap 1–5 years	+	–	–	–	+	+
Intercept	– 0.0186 (– 0.38)	0.0089 (1.27)	0.0099 (2.27)	0.0046 (0.29)	0.0002 (0.02)	0.0130 (1.32)
Fixed gap, 1 year	– 0.0143 (– 8.20)	– 0.0119 (– 7.65)	– 0.0036 (– 2.73)	0.0106 (6.16)	0.0155 (7.16)	0.0171 (2.37)
Variable gap, 1 year	– 0.0169 (– 8.65)	– 0.0116 (– 7.17)	0.0032 (2.02)	0.0180 (8.40)	0.0112 (4.70)	0.0138 (2.03)
Fixed gap, 1–5 years	0.0015 (0.35)	0.0032 (1.01)	0.0068 (3.07)	0.0064 (2.65)	– 0.0004 (– 0.12)	0.0125 (1.94)
Variable gap, 1–5 years	– 0.0049 (– 0.88)	– 0.0051 (– 1.46)	– 0.0107 (– 3.17)	– 0.0046 (– 1.61)	– 0.0072 (– 1.12)	0.0056 (1.05)
Change in assets—3 years	0.0420 (474.01)	0.0342 (6.80)	0.0382 (23.51)	0.0370 (6.19)	0.0460 (8.20)	0.0472 (3.26)
D-deposits	– 0.0067 (– 0.13)	– 0.0225 (– 3.46)	– 0.0087 (– 1.33)	0.0121 (0.75)	0.0028 (0.24)	– 0.0297 (– 1.27)
T-deposits	0.0041 (0.11)	– 0.0008 (– 0.14)	0.0020 (0.32)	0.0074 (1.19)	0.0115 (1.29)	– 0.0269 (– 1.73)
Securities	0.0194 (0.94)	– 0.0075 (– 1.28)	– 0.0159 (– 6.44)	– 0.0205 (– 2.10)	– 0.0118 (– 2.30)	0.0064 (0.45)
Loans	0.0258 (1.26)	0.0016 (0.45)	– 0.0085 (– 2.68)	– 0.0170 (– 1.20)	– 0.0154 (– 2.02)	– 0.0008 (– 0.13)
Adjusted R^2	.9976	.7438	.8478	.7018	.8570	.6907
χ^2 for Fix = Var	3.75	0.07	27.49	13.55	1.75	0.53
$\Pr > \chi^2$	(0.0529)	(0.7937)	(< 0.0001)	(0.0002)	(0.1854)	(0.4648)
χ^2 for Fix 1–5 = Var 1–5	2.86	7.58	21.44	10.89	1.06	1.43
$\Pr > \chi^2$	(0.0906)	(0.0059)	(< 0.0001)	(0.0010)	(0.3027)	(0.2310)
N	10,856	10,485	10,081	9537	9023	8507

The dependent variable in each panel is the three-year-ahead change in net interest income. The independent variables are the fixed- and variable-rate gap for one year, the fixed- and variable-rate gap for one to five years, and the change in total assets for three years. Beginning-of-year total assets scales all variables. White-corrected t statistics are in parentheses, following the coefficient estimates.

Table 9

	Chg1year	Chg2year	Chg3year	Chg5year
<i>(A) Pearson correlation coefficients between the coefficients on the one-to-five-year gap variables from the model in Table 6 and the average changes in interest rates found in Fig. 1. There are six observations in the sample and correlations that are significant at the < 0.10 level are shown in bold type</i>				
Fixed 1–5	–.1837	.3272	.6269	.1045
Variable 1–5	–.1499	.3840	.7145	.3180
<i>(B) Pearson correlation coefficients between the coefficients on the one-to-five-year gap variables from the model in Table 7 and the average changes in interest rates found in Fig. 1. There are six observations in the sample and correlations that are significant at the < 0.10 level are shown in bold type</i>				
Fixed 1–5	–.1012	.0710	–.0116	–.2889
Variable 1–5	.3673	.6786	.6036	–.1027

Table 9 presents the correlations between the estimated coefficients on one-to-five-year gap measures and various interest-rate changes. Table 9 shows that the coefficients from the regressions without the control variables are correlated with the change in the three-year interest rate. These correlations are all of a lower level and significance than the shorter-term tests in Table 4.

We also examine the ability of the one-to-five-year gap to explain the five-year-ahead change in net interest income. The results (not reported) indicate that the gap measures have a minimal amount of explanatory power in these regressions. This is not surprising given that the longer the horizon, the more unlikely banks are to maintain the same asset/liability mix.

7. Conclusion

This paper documents evidence on the efficacy of maturity-gap disclosures of commercial banks in indicating their interest-rate risk exposures in net interest income. For the sample of banks that filed call reports from 1990 to 1997, a period that includes a wide range of interest-rate movements, we find that (i) one-year maturity-gap measures are significantly related to the one-year- and three-years-ahead change in net interest income, (ii) fixed- and variable-rate instruments differ in association with future changes in net interest income, and (iii) the one-to-five-year aggregate gap measures also have some power in explaining three-year-ahead changes in net interest income. These findings hold with or without controlling for the ex post growth in assets as well as the amount of rate-sensitive assets and liabilities (a competing set of explanatory variables). Because maturity-gap data are similar to the tabular-format disclosures required by the SEC (1997), our findings (i) mitigate concerns about the usefulness of the SEC's market-risk-disclosure requirements, (ii) support the SEC's focus on disclosure of information relevant for indicating near-term losses, (iii) support the SEC's requirement to separate fixed and variable instruments, and (iv) suggest that the omission of prepayment and early withdrawal risk from gap measures does not totally compromise the ability of gap data to indicate interest-risk exposures contradicting claims to the contrary by some banks.

One of the concerns is that FRR 48 allows firms to choose from three different formats for market-risk disclosures. The possible confusion these multiple formats might create lead Hodder, Koonce, and McAnally (2001) to conclude:

FRR No. 48's flexibility of application will adversely affect users' risk judgments. Specifically, alternative disclosure formats and measurement bases are not substitutes and, to the extent that they are viewed as such, investors will form inconsistent risk perceptions for the same underlying economic situation. If the SEC wants investors to be able to compare risk-management strategies across companies, then they should mandate just one type of disclosure format.

Their conclusion assumes that a single type of disclosure format would be adequate to compare risk-management strategies across different companies. Our results demonstrate that a simple disclosure of maturity gap is highly associated with the future changes in net interest income. While we do not address the separate issue of the risk related to changing equity values, the risk of net interest income is an important one in and of itself. Because these two types of risk are separable (Toevs, 1983), perhaps they require different types of disclosures. Maturity gap is a simple way to disclose the risk of net interest income across many different interest-rate environments, and a wide cross-section of types of banks.

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Discussion

Comment on “Evidence on the efficacy of interest
rate risk disclosures by commercial banks”
by Ahmed, Beatty, and Bettinghaus

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The shortcomings of the repricing model as a measure of bank interest-rate risk exposure have long been extolled in the literature. The repricing gap is a static measure that does not incorporate increasingly important off-balance-sheet activity. There is overaggregation within each maturity bucket, such that, for example, there is no distinction between assets that reprice in one day versus one year within the one-year cumulative repricing gap. The problem of runoffs (prepayments) is ignored. This is particularly problematic for mortgages because prepayments are often driven by interest-rate fluctuations. Thus, the repricing model would have missed the impact on bank profitability of the huge refinancing boom of the late 1990s–early 2000s, during which most mortgages were repeatedly refinanced at lower and lower interest rates. All of these criticisms make users of the model wary of the results. However, the model is widely used by banking institutions because of its simplicity and low cost of estimation.

In this paper, Ahmed, Beatty, and Bettinghaus evaluate the usefulness of the static repricing model in forecasting bank net interest income over time. Surprisingly, their conclusions are remarkably sanguine. They interpret their conclusions as evidence in support of the repricing model's efficacy as a risk-measurement tool. However, without even criticizing their tests and analysis, one could have drawn the diametrically opposed conclusion from their empirical results. The initial results in Table 2, based on the fixed gap and variable gap as independent variables, are statistically insignificant in 25% of the cases (for 4 out of 16 annual coefficients). The greatest explanatory power comes from the control variable (change in asset size), which is inconsistent with the assumptions of the static repricing gap model in that it incorporates ex post realizations of asset size and

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neglects the feedback effect on the size of the gap of shifts in portfolio positions, which in all but the most pathological of cases will change the gap itself.¹ Moreover, the coefficients on the interactive model in Tables 5 and 6, in which the gap is multiplied by the rate shock, as implied by theory, are usually less than 30% and significantly lower than 100%. Thus, each of the gaps individually explains less than 30% of the fluctuations in the bank's net interest income. When summing the two gaps' coefficients, the results are only slightly better than 50%. Thus, the repricing model, at its best, explains only around 50% of the bank's interest-rate risk exposure. And this coin-flip explanatory power is obtained only after assuming perfect forecastability of interest-rate shocks by using *ex post* realizations of rate changes in the interactive term in the regressions. Instead, if a contemporaneous interest rate forecast would have been used (e.g., the forward rate for U.S. Treasury securities on the gap estimation date), then the explanatory power of the model would have been even lower.

My conclusion on reading this paper is that the repricing model does a poor job of estimating the impact of unanticipated fluctuations in interest rates on bank profitability. Thus, I would have liked to see the explanatory power of the repricing model compared to that of the tabular model required in SEC disclosures, which the authors contend is potentially more useful as a risk measure, because the SEC regulations incorporate off-balance-sheet risk disclosures, as well as control for runoffs. However, no such analysis was performed. One reason this was not done, presumably, was that the bank regulators did not require separate disclosure of the fixed gap and the variable gap after 1997, the year of the introduction of the SEC reporting requirement. However, this should not serve as a fatal shortcoming, because the distinction between the fixed and variable gap is artificial; according to the repricing model, it is the total gap that is used to measure the impact of interest rate fluctuations on net interest income. Moreover, using a sample period that started in 1997 would have been more interesting, because it would have tested the repricing model's explanatory power during the mortgage refinancing boom.

Another modeling choice of the authors was to use annual bank call-report data rather than quarterly data. The static assumptions of the repricing model are less egregious for shorter time periods, and therefore, it would have been interesting to see if the repricing model performed well over the quarterly or six-month period. Moreover, the explanatory power of different maturity buckets could have been compared. Because of the restrictions of annual data, only the one year and one-to-five-year periods were analyzed in the paper. It is not clear why the three-year period was chosen as that does not match the repricing model's chosen time periods of up to one year and one-to-five years. However, if quarterly data were used instead of annual data, then the authors could have examined the maximum forecasting range of the repricing model by comparing the explanatory power of the one-quarter gap to the two-quarter gap, and so forth. Indeed, this could have been done in some form even using annual data. Rather than utilize the three-year-ahead changes in net

¹ The contention in Footnote 8 of the paper, that the net interest income changes can be decomposed into a gap effect and an asset change effect, ignores the possibility of interdependence between these two effects. In particular, changes in asset holdings can be an interest-rate-risk-management tool to respond to undesirable gap positions.

interest income in Tables 7 and 8, the authors could have telescoped the repricing models to test the marginal explanatory power of the one-to-five-year gap on changes in net interest income over the one-to-five-year period. For example, each of the following models could be tested individually:

$$\Delta \text{NII}_{t+1} = \Delta r_{t+1} \text{GAP}_1$$

$$\Delta \text{NII}_{t+5} = \Delta r_{t+5} \text{GAP}_{1-5}$$

$$\Delta \text{NII}_{t+6} = \Delta r_{t+6} \text{GAP}_{>5}$$

Table 1 shows that the fixed gap was negative in each year from 1990 to 1991, whereas the variable gap was positive over the same period. However, the signs of the coefficients on the gap independent variables in Table 2 are the same in all years except 1993 and 1997 (and then one sign is insignificantly different from zero). However, this undermines the authors' conclusion that the coefficient of the gap can be interpreted as the average change in the one year interest rate. For example, if net interest income were increasing, a negative coefficient on each gap independent variable would imply that interest rates were simultaneously increasing (for the positive variable gap) and decreasing (for the negative fixed gap). It is not clear that the coefficients to the gap independent variables can be interpreted as interest rate fluctuations. Table 4 correlation coefficients are unconvincing because of the small sample size (only eight observations).

This paper has provided some interesting and convincing evidence. However, the evidence is mostly against the hypothesis put forth by the authors.

Discussion

Discussion of “Evidence on the efficacy of interest rate risk disclosures by commercial banks”

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1. Introduction

Canadian researchers and policymakers, who can count the number of domestic banks on their fingers, surely envy the research opportunity afforded by the availability of data for more than 10,000 U.S. banks. Ahmed, Beatty, and Bettinghaus (2004) exploit this opportunity in a novel way. Rather than testing a hypothesis, they describe the extent to which banks' maturity-gap disclosures “indicate their net income that is exposed to interest-rate risk.” This is an interesting exercise because although it is well known that customer-relationship issues complicate banks' exposures (Begley, Chamberlain, and Li, 2003), there is little descriptive evidence relating banks' maturity-gap disclosures to their actual net income sensitivity to interest-rate changes. This paper provides such evidence. The first section of my discussion addresses its interpretation.

The authors see associations between gap and future net interest income as evidence justifying the disclosure requirements of SEC Financial Reporting Release No. 48 (FRR No. 48, SEC, 1997). A better basis for such a conclusion, beyond the present study's scope, would be to reestimate the regression coefficients using actual FRR No. 48 data and see if the magnitude of the new estimates were more consistent with expectations than the ones obtained using pre-FRR No. 48 data. The second section of the discussion offers suggestions along these lines for future studies and some proposals for further exploiting pre-FRR No. 48 data.

2. Interpretation of results

To facilitate the discussion, I simplify the authors' model as follows. At time t , let a bank's maturity gap be $G_t = A_t - L_t$, where A_t represents the bank's interest-earning assets

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and L_t its interest-bearing liabilities. In a base case, the difference between the bank's net interest income for the year ending at Time 2 and its net interest income for the year ending at Time 1 can be represented as $\Delta NI_{1,2} = G_1 \times \Delta r$. In this expression, Δr is the beginning-of-year change in an interest rate applicable to both assets and liabilities. The gap, G_1 , is the same as it was during Year 1 and is constant during Year 2 because either the bank is not growing or any increases in financial assets (loans) are coincidental with increases in liabilities (deposits). Although it is unrealistic, I find this base case helpful in organizing my thinking about the authors' analyses.

The authors perform cross-sectional regressions of $\Delta NI_{1,2}$ on G_1 and other variables meant to capture some complexities that the base case omits, finding that the coefficient of G_1 is less than Δr . In a sense, this is like regressing current tax expense on net income across a sample of firms and finding that the slope coefficient is less than the statutory tax rate (τ). Such results are not surprising. Yet, they are interesting because they raise questions about why the estimated coefficients are *not* equal to Δr and τ , respectively. We know that banks can dampen their interest-rate exposures by hedging with derivatives and dynamically rebalancing their long and short portfolios; but on average, how much do they hedge and what is the resulting exposure? Similarly, we know that firms can reduce the sensitivity of current tax expense to accounting income by deliberately altering the timing and character of income for tax purposes; but on average, how successful is their tax planning, and what is the resulting effective tax rate? Ideally, the results of such descriptive studies provide preliminary answers to the questions and set the stage for further analysis of firms' hedging and tax-planning activities.

The estimated coefficients of G_1 are generally much less than Δr . In Tables 2 and 3, the estimates are often less than 1% of Δr . These estimates strike me as being implausibly low, as would τ estimates equal to about 1% of the statutory tax rate. In Tables 5 and 6, which allow for fixed firm and time effects, the estimates of Δr are generally about a third of their theoretical values. These estimates are much more reasonable. They are consistent with the notion that banks hedge a very substantial but plausible portion of their net interest-income exposure. I think the results also imply that future studies must either control for individual bank characteristics or divide bank samples into homogeneous subsamples before performing cross-sectional regression analyses like those underlying the results in Tables 2 and 3.

To explore why the estimates of Δr are so tiny in Tables 2 and 3, one can extend the base case by adding a term, ΔG , that represents the change in gap over the period ending at Time 2. One can then decompose the total change in net interest income, $r_2 G_2 - r_1 G_1$, into a rate variance $G_1 \times \Delta r$ and a volume variance $r_2 \times \Delta G$, that is:

$$\Delta NI_{1,2} = r_2 G_2 - r_1 G_1 = G_1 \Delta r + r_2 \Delta G$$

Most U.S. banks provide such a "postmortem" explanation for changes in all of the categories of net interest income in their annual reports. For instance, the Bank of America in its 2002 annual report states "[t]he changes for each category of interest income and expense are divided between the portion of change attributable to the variance in volume or rate for that category. . . ." (p. 60). Thus, it seems that a regression of $\Delta NI_{1,2}$ on both G_1 and ΔG would be necessary to obtain reliable estimates of the extent to which banks'

maturity gap disclosures “indicate their net income that is exposed to interest-rate risk.” However, the main regression in the paper takes the following form:

$$\Delta NI_{1,2} = \beta_0 + \beta_1 \times G_1 + \beta_2 \times (\text{Asset growth}) + \text{other control variables} + \text{noise}$$

At the conference, I remarked that ΔG would be a better regressor than asset growth; both are observable ex post. In response, the authors tried using “net growth in rate sensitive assets” and report that the substitution “did *not* make a material change in test results” (p. 14, emphasis added). This result is intriguing because, generally, increases in bank assets (e.g., loans) are associated with increases in liabilities (e.g., deposits). If assets and liabilities increase equally (dollar for dollar), then $A - L$ is constant and the change in gap is zero whatever the asset growth. In that case, asset growth is not a valid proxy for ΔG because assets could be growing rapidly while G was constant.

More generally, under base case assumptions, the theoretical value of β_2 using ΔG as the regressor would be $\partial \Delta NI_{1,2} / \partial \Delta G = r_2$; the theoretical value of β_2 using ΔA as the regressor is $\partial \Delta NI_{1,2} / \partial \Delta A$, which can be broken down as follows:

$$\partial \Delta NI_{1,2} / \partial \Delta A = \partial \Delta NI_{1,2} / \partial \Delta G \times \partial \Delta G / \partial \Delta A = r_2(1 - \partial L / \partial A)$$

Thus, if $A - L$ is constant, $\partial L / \partial A = 1$ and the estimated value of β_2 should be zero. This is not what the authors find in Table 2. Indeed, β_2 is generally very large compared with other estimated coefficients in the regression model and highly significant. Thus, the conclusion that assets do *not* increase dollar for dollar with liabilities seems warranted.

Another naïve but more plausible scenario is that liabilities are a constant percentage of assets: $L_t = kA_t$. In Table 1, the authors report that generally $k > 1$ (i.e., liabilities exceed assets) for fixed gap and $k < 1$ (assets exceed liabilities) for variable gap. I conjecture that while $\partial L / \partial A$ is not equal to one, it is far from being zero across firms. Although a correlation matrix including A and L would be the best way to confirm this, one can crudely estimate $\partial L / \partial A$ as follows: Let

$$DG \equiv \frac{A - L}{A}$$

represent the deflated gap values reported in Table 1. Then:

$$L = (1 - DG) \times A$$

One can then use the quantity $(1 - DG)$ as a rough estimate of $\partial L / \partial A$. Because the average values of DG range from -0.16 to $+0.34$ (across both derivative users and nonusers), a plausible range for $\partial L / \partial A$ across the years is 1.16 to 0.66 —not one, but not different enough from one to allay my concern that growth in assets is probably not a good proxy for growth in gap. The facts that β_2 is statistically significant, and that substituting ΔG for ΔA does not materially change the estimate of β_2 , deserve further examination in my view.

The results in Tables 5 and 6, based on regression models incorporating fixed firm and time effects, are much more plausible. One expects regression coefficients equal to one under base case assumptions. The actual coefficients are around one third, less for

derivative users. I think this regression setup provides a much better basis for further exploring associations between the magnitude of coefficients and bank-specific factors.

3. Suggestions for future research

Banks' omission of derivatives prior to FRR No. 48 introduces measurement error in gap, contributing to the tiny regression estimate of Δr in Tables 2 and 3 and probably also reducing the reliability of estimated coefficients in Tables 5 and 6. Aware of this, the authors report that estimated gap coefficients are less for derivative users than for nonusers as expected. In my view, however, repeating the exercise with derivatives included in gap is a priority now that sufficient FRR No. 48 data are available.

Prior to performing that exercise, one can further exploit the study's data as follows. The authors recognize that banks' exposure to interest rates differs from simple proportionality with gap not only because banks use derivatives, but also because borrowers often hold prepayment options (banks are short put options) and depositors generally hold early withdrawal options (banks are short call options). An equally important factor, not explicitly mentioned, is that banks often offer credit facilities allowing customers to borrow additional funds at a prespecified rate of interest should the market rate increase (banks are short call options). Because banks are short of these customer-related options, favorable changes in interest rates are unlikely to benefit banks as much as unfavorable changes hurt them. This suggests a straightforward extension: Compare regression coefficients for favorable and unfavorable values of Δr . A favorable value of Δr occurs if (a) gap is positive and interest rates increase or (b) gap is negative and rates decrease. Although the interest-rate changes per se are favorable to banks in both (a) and (b), it is likely that some customers will exercise their options, so banks will not enjoy the full benefit of the rate changes. An unfavorable value of Δr occurs if (c) gap is positive and interest rates decrease or (d) gap is negative and rates increase. In competitive financial markets, banks need to pass on these rate changes to customers. Therefore, all else being equal, I expect the coefficient of G_1 to be higher for unfavorable than for favorable interest-rate changes.¹

It is costly for banks to hedge their short positions in the options that customers hold. However, there is a well-developed market for credit derivatives and an emerging market for the option-like securities that mimic credit facilities. Therefore, it would also be interesting to repeat the analysis for derivative users and nonusers, to see if derivative users are more symmetrically exposed to favorable and unfavorable interest-rate changes than nonusers.

Another potentially fruitful project would involve reestimating all coefficients using FRR No. 48 data. This approach, similar to that of Thornton and Welker (2004), emphasizes the incremental information content of FRR No. 48 disclosures.² The new

¹ Notice that the authors' examination of positive and negative interest-rate changes does not facilitate such a comparison because long and short positions differ across banks and for fixed and variable instruments.

² Curiously, the authors measure "on-balance-sheet maturity gap" (p. 3, emphasis theirs) but then suggest that "gap disclosures provide additional information beyond what is provided in the balance sheet" (p. 4).

disclosures are potentially incrementally informative in at least four ways: (1) They include derivatives. (2) They group financial instruments in time buckets based on management's best estimates of expected (not contractual) maturity. (3) They offer a finer breakdown of maturity timing. (4) They enjoin management to discuss the disclosures in their 10-K Management Discussion and Analyses (MD&A).³ An MD&A provides investors with a view of the bank through the eyes of management. Banks are likely to trade off variables strategically. For example, depending on their geographic location and clientele base, some banks offer free checking but pay little or no deposit interest, while others charge for checking but pay competitive rates of interest. Some banks find it cost effective to hedge with derivatives while others do not. By outlining and discussing the rationale for such tradeoffs, the MD&A should facilitate researchers parsing bank samples into subsamples that are likely to yield consistent cross-sectional regression coefficients.

Yet another potentially fruitful extension of the research would analyze banks' fair-value exposures to interest-rate changes.⁴ Banks with fixed-rate exposure are vulnerable to fair-value volatility when interest rates change because of liquidity and capital-adequacy concerns. Following SFAS No. 133, banks carry derivatives at fair value, so one can see if banks' derivative exposures implied by FRR No. 48 disclosures eventuate when interest rates change. The results would be interesting because banks can terminate derivative exposures by instantaneously settling the contracts or by taking offsetting positions in an impersonal marketplace. Altering net interest income exposures stemming from loan and deposit positions is comparatively costly because it can jeopardize fee income and other benefits flowing from customer-specific capital.⁵ Thus, inferences concerning fair-value exposures from static, end-of-quarter positions depicted by FRR No. 48 disclosures may be less reliable than those concerning net interest-income exposures. Moreover, since banks successfully resisted marking loans and deposits to market, it is likely that confirmation of their full fair-value sensitivity will continue to elude both researchers and financial statement users.

4. Conclusions

Although the authors could have enhanced the description of banks' sensitivity to interest-rate changes using their existing data, the study is a useful addition to the literature. The results are consistent with the intuition that banks are more than passive conduits from savers to borrowers. Derivative users generally reduce their net interest exposures to market-rate changes. Even nonderivative users' net-income sensitivity is generally much less than the gap times interest-rate changes. This suggests that bank

³ FRR No. 48 disclosures also have the potential to enhance investor consensus as to banks' exposure to interest-rate changes (Linsmeier, Thornton, Venkatachalam, & Welker, 2002).

⁴ Bodurtha and Thornton (2002) describe the distinction between fair-value exposures and cash flow net income exposures.

⁵ The authors' finding that banks' 1-year gap helps predict 3-year-ahead net interest income is consistent with both the existence of customer relationship capital and persistence in banks' lending and borrowing policies.

activities possess operating as well as financial characteristics (Feltham & Ohlson, 1995), probably stemming from customer-relationship capital.

The authors' derivation and measurement of gap give future researchers a good starting point in modeling banks' exposures to interest rates, whether they use call report data or FRR No. 48 data. I do not think that the results of the study justify the SEC's issuance of FRR No. 48. Justification would more logically come from evidence of the incremental information content of the actual FRR No. 48 disclosures, and regression coefficients that are closer to theoretical values, given gap measures based on banks' derivative and nonderivative positions.

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Reply

Response to discussants
“Evidence on the efficacy of interest rate risk
disclosures by commercial banks”

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1. Introduction

We thank both discussants for their comments at the conference. Their comments essentially fall into three groups:

- ☐ Critique of our methodology
- ☐ Issues relating to interpretation
- ☐ Suggestions for future work.

2. Methodology

Both discussants note that the estimated coefficients in our regressions are considerably less than their theoretical values. Dan Thornton suggests that a potential explanation for this difference may be the omission of change in gap as an explanatory variable. Because we expect change in gap to be correlated with change in total assets, this limitation is mitigated to some extent by including change in total assets as an independent variable. Nevertheless, we repeated our tests after including the change in fixed gap and change in variable gap as additional explanatory variables. The coefficients on fixed gap and variable gap in the augmented regressions are not generally larger in magnitude than the coefficients reported in our tables. Thus, the differences between the estimated value of coefficients and the theoretical value of coefficients are unlikely to be driven by the omission of change in gap. Another reason why the estimated coefficients may be below their theoretical values is that gap measures are noisy because they do not reflect the effects of off-balance-sheet instruments, dynamic portfolio adjustment, and prepayment

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options. Including change in gap does not mitigate the noise due to these inherent limitations.

Linda Allen suggests that we could have used quarterly data and examined different maturity buckets. There are two reasons why we did not use quarterly data. First, the SEC requires disclosure of information for instruments maturing in each of the next 5 years (and an aggregate amount for the remaining years). This suggests the use of annual data. Second, quarterly changes in rates would in general be smaller in magnitude than annual changes thereby making it difficult to detect.

3. Interpretation

We respectfully disagree with Linda Allen's interpretation and specifically her conclusion that "the evidence is mostly against the hypothesis . . ." To our knowledge, no prior study has empirically documented evidence on the usefulness of gap data. Our study does show that gap has *some* predictive ability and that the sign of the coefficients on gap are mostly consistent with the signs implied by theory, though their magnitudes are less than their theoretical magnitudes.

An important difference between our interpretation of the results and Linda Allen's interpretation is that she seems to suggest that the relation between gap and future changes in interest rates depends on the sign of gap. We disagree with this assertion. Intuitively, a positive 1-year gap means more assets are maturing or repricing than liabilities within 1 year. If rates increase, the assets can be reinvested at the higher rate leading to a positive change in net interest income in future. If rates decrease, the assets will be reinvested at the lower rate leading to a negative change in net interest income in future. Similarly, a negative one-year gap means more liabilities are maturing or repricing than assets within 1 year. If rates increase, the liabilities will be refinanced at the higher rate leading to a negative change in net interest income in future. If rates decrease, the liabilities can be refinanced at the lower rate leading to a positive change in net interest income in future. Thus, the impact of gap on future interest income depends on the sign of the interest rate change (and not on the sign of the gap).

4. Suggestions for future research

We agree with the suggestions for future research made by both discussants. In particular, a more direct examination of FRR48 disclosures would be a fruitful avenue for future research.

A framework for the analysis of firm risk communication[☆]

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Abstract

In this paper, we propose a framework for the analysis of risk communication and an index to measure the quality of risk disclosure. Mainstream literature on voluntary disclosure has emphasized that quantity can be used as a sound proxy for quality. We contend that, in the analysis of the disclosure of risks made by public companies, attention has to be paid not only to *how much* is disclosed but also to *what* is disclosed and *how*.

We apply the framework to a sample of nonfinancial companies listed in the ordinary market on the Italian Stock Exchange. To verify that the framework and synthetic index are not influenced by the two factors recognized in the literature as the most powerful drivers of disclosure behavior for listed companies, we use an OLS model. The regression shows that the index of *disclosure quantity* is not influenced either by size or industry. Thus, the synthetic measure can be used to rank the quality of the disclosure of risks.

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Keywords: Risk communication; Disclosure quantity; Reproducibility; Accuracy

1. Introduction

The increasing complexity of business strategies, operations, and regulations makes it quite difficult for investors to appreciate financial information on its own without clear, accompanying explanations (Marston & Shrides, 1991). Moreover, shareholders and other stakeholders require public companies to disclose information concerning their prospects for future performance and the sustainability of current value-creation drivers. In this

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sense, the narrative component of financial communication is an important means not only of clarifying and validating the quantitative measures contained in financial statements (Chungh & Meador, 1984), but also for offering useful insights into value-generation drivers (Lev & Zarowin, 1999; Gelb & Zarowin, 2000; Robb, Single, & Zarzeski, 2001). A general consensus seems to have been reached also on the point that the more financial reports look ahead, the greater are their importance for investors (Francis & Schipper, 1999).

To effectively fulfil the demands of their stakeholders, listed companies have been improving the communication of their long-term value-generation capabilities by increasing the amount of information disclosed with regard to the risks faced and their expected impact on future profits. However, disclosing current financial risks will not provide sufficient information about the financial status of a company because financial performance is also affected (and even more so) by strategic and operating risks (EIU-MMC, 2001). In this paper, we propose a framework for the analysis of risk communication.

We contend that the quantity of disclosure is not a satisfactory proxy for the quality of disclosure. In the proposed framework, quality of disclosure depends both on the quantity of information disclosed and on the richness offered by additional information. While the quantity of disclosure has been discussed in previous literature, little attention has been paid, until now, to the richness of the information in quality. In our view, semantic properties of disclosures about future prospects, that is, the richness—determines whether or not the information helps outside investors appreciate the expected impact of disclosed risks on the firms' capability to create value.

To identify the additional insights and to evaluate the contribution that a more articulated framework for the analysis of risk communication can offer, instead of merely counting the number of disclosed items, the proposed framework is applied to a sample of nonfinancial companies listed in an unregulated financial market. We chose companies listed on the Italian Stock Exchange. Because there are no regulations on this topic, the disclosures about risks offered by the observed companies are almost totally voluntary, and not driven by rules that can influence both the content of the disclosures and the way in which the information is presented.

The paper proceeds as follows. The next section discusses the relevance of the disclosure of risks. A review of literature is also presented. The major guidelines for risk disclosure are discussed in Section 3. In Sections 4 and 5, a framework for the analysis of risk disclosure is presented. In Sections 6 and 7, the research methodology is discussed and some insights are offered for the analysis of risk disclosure. Conclusions and the direction of further research follows.

2. The relevance of the disclosure of risks

Investors need to understand the risks a company takes to create value and they want to have information on the sustainability of current value-creation strategies. Recent surveys of institutional investors (pension funds, investment trusts, unit trusts, and insurance companies) revealed a strong demand for increased corporate risk disclosure to improve

portfolio-investment decisions (Solomon, Solomon, Norton, & Joseph, 2000). Top managers must therefore be in a position to assure investors that risks and uncertainties are well managed (DeLoach, 2000).

This requires not only the implementation of firm-wide risk-management systems, but also effective communication about the risks affecting a firm's strategies and the actions management plans to take to capitalize on emerging opportunities as well as to minimize the risk of failures. If listed companies communicate information about existing risks and uncertainties, the external investors' ability to deal effectively with risk diversification in the management of their investment portfolios is severely undermined. That may lead to a general lack of confidence in the reliability of institutional financial information. Nonetheless, the status of current regulation of risk reporting reveals a piecemeal approach, focused predominantly on market risk associated with the use of derivatives (e.g., FAS 119, FAS 133, IAS 32, and IAS 39).

Although the importance of the issue could not be overemphasized, as was recently proved by unexpected reporting failures involving some of the largest companies listed on the major stock markets, up to now, little attempt has been made by regulatory bodies to provide an explicit integrated framework for corporate risk disclosure (Solomon et al., 2000).

In the United States, Financial Reporting Release No. 48 (FRR 48), issued in 1997, requires SEC registrants to disclose both qualitative and quantitative information about market risks (potential losses arising from adverse changes in interest rates, foreign currency rates, commodity prices, and equity prices). Empirical studies suggest that these requirements do little to enhance the quality of risk reporting: disclosure provided by listed companies has wide variations in detail and clarity (Elmy, LeGuyader, & Linsmeier, 1998; Roulstone, 1999), it is spread throughout the Management Discussion & Analysis (MD&A), and the notes to financial statements make it difficult for investors to gather information and make appropriate risk assessments (Hodder, Koonce, & McNally, 2001). Nonetheless, other findings support the usefulness of this kind of disclosure to investors (Jarion, 2002; Linsmeier, Thornton, Venkatachalam, & Welker, 2002; Rajgopal, 1999).

In the United Kingdom, the Operating and Financial Review (OFR), the equivalent of the MD&A, introduced in 1993 for listed companies and still nonmandatory, recommends including a review of key risks. The Combined Code on Corporate Governance, published by the London Stock Exchange in 1998, requires listed companies to maintain a sound system of internal control and to explain how it works. The guidance emphasizes the need for internal risk-management procedures and encourages companies to report externally on their key risks, but without making it mandatory (Woods & Reber, 2003). A research study of narrative reporting in the United Kingdom found that, of those companies which had provided an operating and financial review, only 13% made available some clear discussion of trends affecting the future and 18% identified some relevant risks and uncertainties in the main lines of business that may have a major effect on future results (ICAEW, 1998).

In Germany, GAS5 requires that information about risks be presented in a self-contained section of management report that accompanies consolidated financial statements. Because it is acknowledged that risks are firm specific, no specific classification is

imposed: risks should be classified according to the classification scheme adopted for internal risk management. Empirical evidence reveals significant deficiencies regarding these mandatory risk disclosures (Kajüter, 2003).

Current reporting regulations in highly regulated countries tend to focus either on a narrow set of risks, primarily market and credit risks and those connected with the use of financial instruments (Young & Guenter, 2003). Reporting regulation on the disclosure of risks also tend to focus on special circumstances, like security offerings by the flotation process due to pressure put on companies prospectuses tend to contain more information about the risk profile of companies than the annual reports requested by the regulatory bodies of different financial markets. Unfortunately, and as a general rule, disclosures on risk tail off after flotation (ICAEW, 1999). Under current provisions, therefore, corporate risk disclosure is still at the discretion of the board of directors of individual companies, more a matter of voluntary disclosure than a question of complying with regulations.

Only a limited number of academic studies have applied a broad perspective to corporate risk disclosure. The role of forward-looking information in voluntary disclosure has been associated with a more accurate analysts' earnings forecasts (Barron, Kile, & Keefe, 1999) and with a more accurate level of share-price anticipation (Schleicher & Walker, 1999). Carlon, Loftus, and Miller (2000) studied the annual reports of 54 Australian companies operating in the mining sector, signaling relevant variations in the extent and detail of voluntary risk disclosures. Kajüter (2003) analyzed the mandatory risk disclosures in management reports of listed German companies and revealed significant deficiencies. Shrives and Linsley (2002) analyzed voluntary risk disclosures through the OFR for 82 United Kingdom companies listed on the London Stock Exchange and found no correlation between risk disclosures and market betas. Lajili and Zéghal (2003) analyzed the MD&A of 300 Canadian listed companies and found that voluntary risk disclosures in annual reports are almost entirely qualitative in nature and lacking in specificity and depth.

Comparative studies on the disclosure practices of United Kingdom and German listed companies (Shrives & Linsley, 2003; Woods & Reber, 2003) reach different conclusions about the role of regulation in promoting the quality of risk disclosures. Risk disclosure is just becoming a serious topic for research. Empirical studies that take a broad perspective are still rather scarce and offer only tentative and preliminary conclusions.

3. Guidance for voluntary disclosure of risks

In the absence of specific regulations, managers who decide to disclose risk information can refer to guidance on effective voluntary disclosure provided by professional associations and academia. The American Institute of Certified Public Accountants (AICPA, 1994) proposed a framework for voluntary disclosure aimed at improving the quality and effectiveness of financial reporting (Jenkins Committee Report). To provide information for investors, companies should consider disclosing data and information along five lines: *financial and nonfinancial data; management's analysis of financial and nonfinancial data; forward-looking information; information on managers and stakeholders; and company background*. Recently, due to its increasing importance, the intangible-asset

dimension has been added to the existing five categories (FASB, 2001). Wallman's (1996) framework for disclosure complements information that fully meets accounting-recognition criteria (*current financial statements*) with information that does not meet (or only partially meets) these criteria (*research and development, forward-looking information, customer satisfaction, risk measures, and intellectual capital*). The Canadian Institute of Chartered Accountants' reporting guidelines (CICA, 2001) suggest a reporting framework that includes information concerning *company's vision* (core business and long-term business strategy); *critical success factors*; *capabilities (resources) to achieve desired results*; *expected results*; and *connected risks and opportunities*. It should be noted that all the considered frameworks explicitly propose to enrich financial reporting by including a section devoted to communicating forward-looking information and to sketching the risk profile of the company.

More focused guidance on risk disclosure is offered by papers issued by professional bodies and research institutes (ICAEW, 1998, 1999, 2000a, 2000b; CICA, 2001; IFAC, 2002). All these papers share the common goal of proposing principles and structures for approaching forward-looking disclosure and communication of a fair and integrated view of the company risk profile. Best practices taken from listed companies are also provided, thus filling the void of reporting standards.

According to ICAEW (2000a, p. 14) "risk can only be appreciated in the broader context of a company's strategy." The reporting of risk must therefore consider information on strategy, actions, and performance in addition to information specifically focused on risk. In this guidance, the concepts of risk and forward-looking information are closely intertwined.

According to the CICA framework (CICA, 2001), forward-looking information completes retrospective financial and nonfinancial information to facilitate a better appreciation of the impact of events, decisions, and actions on value creation. Forward-looking information refers to (i) future events, decisions, opportunities, and risks that can have a likely effect on future results; (ii) vision, strategies, and objectives expressed by management; and (iii) explanation of past events, decisions, facts, and results that can have a significant impact on future results. It is also suggested to disclose information concerning (i) core business and strategies, (ii) critical success factors, (iii) capacity to deliver results, (iv) results (past and future), and (v) risks. According to this guidance, forward-looking information and risks should be communicated *as specifically as possible* and they should refer to different objects of external communication.

Both CICA and ICAEW frameworks suggest that risk disclosure focuses on the sources of uncertainty that affect volatility, on the different types of risk, and, finally, on expected future performance. Accordingly, we defined *risk disclosure* as the communication of information concerning firms' strategies, characteristics, operations, and other external factors that have the potential to affect expected results.

4. A framework for the analysis of risk communication

Mainstream literature on voluntary disclosure has focused on quantity and then used that aspect as a sound proxy for the quality dimension of disclosure. Some researchers

propose simple quantity–quality indices based mainly on a dichotomous score (Marston & Shrivess, 1991; Sinhvi & Desai, 1971; Zarzeski, 1996). Others hoping to differentiate quality, adopt weighted indices of disclosure, subjectively assessing the weight to be attributed to each item disclosed (Botosan, 1997; Wallace, 1988; Wallace & Naser, 1995) or to the type of measure associated with the information disclosed (Guthrie, Petty, Ferrier, & Wells, 1999).

However, little attention has been paid in the extant literature to the *semantic properties* of information. We contend that, in the analysis of the disclosure of risks made by public companies, attention has to be paid not only to *how much* is disclosed but also to *what* is disclosed and *how*.

We propose a framework for the analysis of risk disclosure that considers four different but complementary dimensions: the *content* of information disclosed; the *economic sign* attributed to expected impacts; the *type of measures* used to quantify and qualify the expected impacts; (the *outlook orientation* of risk communication) and the managerial approach to the management of risks.

Without a clear body of academic literature concerning the *contents* and *semantic properties* of corporate risk disclosure, we built the framework using the guidance on voluntary risk reporting issued by professional bodies (AICPA, 1994; CICA, 2001; FASB, 2001; ICAEW, 2002), in the accounting literature (Robb et al., 2001), and in the guidelines for risk assessment and analysis proposed by practitioners (Bell, Marrs, Solomon, & Thomas, 1997; DeLoach, 2000).

In the proposed framework, the content of disclosures is reduced to the following categories: strategy (goals for performance, mission, broad objectives, and way to achieve objectives); company characteristics, such as financial structure, corporate structure (changes in ownership, mergers, and acquisitions), technological structure (core and support technologies), organization (organizational structure and human resources management), and business processes (concerning the way operations are managed); and environment around the company (legal and regulatory, political, economic, financial, social, natural, and industry).

Moving to the analysis of the semantic properties of the information disclosed, we propose that disclosure is enriched by the way the expected impact of disclosed risks are qualified and quantified. The communication measurement of the expected impact can be articulated in two complementary components:

- the *economic sign*, that communicates the direction of the expected impact of risks upon the future performance of the firm;
- the *type of measure* used in order to specify the economic sign. The measurement can be expressed in qualitative or quantitative terms, using either monetary or nonmonetary scales.

The guidance proposed by CICA (2001) and ICAEW (2002) underlines the importance of communicating management's approach to risks and the capabilities and resources devoted to it. Accordingly, another dimension of analysis is considered in the proposed framework: the *outlook orientation*. Outlook orientation reflects both the time orientation of the information disclosed (information may just refer to the actual state or be projected into the future) and the

Table 1
A classification scheme: risk factors and semantic properties

Category	Modalities
<i>Risk factors</i>	
Content	Company strategy Strategy Company characteristics Financial structure Corporate structure Technological structure Organization Business processes Environment around the company Industry Legal–regulatory environment Environment: political, economic, financial, social, natural, legal–regulatory
<i>Semantic properties</i>	
Economic sign	Positive Equal Negative Not disclosed
Type of measures	Financial quantitative Financial qualitative Nonfinancial quantitative Nonfinancial qualitative No measures
Outlook orientation	Hypothesis–expectation Programs Actions or decisions taken Actual state

approach management toward adopted risk (disclosed information can simply communicate general hypotheses or expectations concerning the future, or provide information concerning management programs or action to be taken in order to face exposed risks).

Table 1 presents the classification scheme proposed.

5. The dimensions for the analysis of risk communication: methodological issues

There are some methodological issues we wish to discuss in connection with the measurement of the dimensions proposed for the analysis of risk disclosure. As far as *quantity* of communication is concerned, two aspects have to be balanced. On the one hand, the absolute number of pieces of information disclosed has to be considered as a proxy of the amount of disclosure provided by companies. On the other hand, the

relevance assumed by risk-related information in voluntary disclosure depends on the weight it has inside the overall (voluntary) communication. We refer to the first dimension as *quantity* (strictu sensu) and to the second as *density* of disclosure.

As far as the *semantic properties* of communication are concerned, we consider the disclosure of the expected impacts of considered risks and the orientation of management in activating programs, actions, and resources in order to face risks. We refer to the first dimension as *depth* and to the second as *outlook profile*.

As regards the *quantity* dimension, many empirical studies have demonstrated that the level of disclosure is highly influenced by size and industry (Ahmed & Courtis, 1999; Belkaoui & Kapik, 1989; Cooke, 1992; Firth, 1979; Healy & Palepu, 1994; Richardson & Welker, 2001; Robb et al., 2001). For this reason we contend that an absolute index (e.g., the number of phrases containing risk disclosure) is not adequate to appreciate the relative quantity of disclosure made by any company. To investigate the overall amount of disclosure made by any single company, an OLS regression equation was estimated using size and industry as independent variables. An index that measures the relative quantity of disclosure is also proposed. As proposed in Beattie, McInnes, and Fearnley (2002), the standardized residuals of the regression were used as a *proxy* for the disclosure quantity.

The regression model is as follows: $\hat{D}_i = \beta_0 + \sum_{j=1}^k \beta_j \text{IND}_i + \beta_{k+1} \text{LNSIZE}_i$, and the standardized residuals (relative quantity) are obtained by using Eq. (1). The RQT index is greater when a company discloses more information than the average of companies belonging to the same industry, adjusted by size. As a consequence, the quantity of information is not measured “as is” in the index: it is adjusted by the two external factors that are expected to influence the level of disclosure

$$\text{RQT}_i = D_i - \hat{D}_i \quad (1)$$

where RQT_i = relative quantity index for company i ; D_i = observed disclosure for company i ; and \hat{D}_i = estimated disclosure for company i .

As regards the *density* dimension, it is evident that the style of writing strongly influences the effectiveness of narrative reporting. We contend that the relevance of risk information disclosed in narrative reporting is influenced by how much it is diluted into the mass of the other pieces of information disclosed. On the one hand, from the reader’s perspective, finding a low number of risk-related pieces of information among hundreds of pages of narrative reporting makes it difficult to appreciate the system of risks affecting a firm’s prospects. On the other hand, from the company’s perspective, diluting a limited number of risk-related pieces of information in a thick document as the annual report may reveal a strategy of “hiding the needle in a haystack”: relevant information is communicated (so they cannot be changed with holding) but in a way that makes it hard for a reader to find. We define *density* of communication as the ratio between the number of sentences in which risk information is provided over the total number of sentences included in the MD&A (Eq. (2)). As a consequence, the value assumed by the DEN index is between 0 and 1: the index assumes higher value when the relevance of risk information in the annual report is greater.

$$\text{DEN}_i = \frac{1}{k_i} \sum_{j=1}^k \text{RFL}_{ij} \quad (2)$$

where DEN_i = density index for company i ; k_i = number of sentences in the annual report of company i ; $RFL_{ij} = 1$ if the sentence j in the annual report of company i contains risk information and $RFL_{ij} = 0$, otherwise.

The third dimension we adopted to quantify the risk communication profile is *depth*. Depth concerns the contents of information disclosed regarding the expected economic impact of identified risks upon future performance. To measure the depth of disclosure, the index presented in Eq. (3) is proposed. This index summarizes two of the semantic properties in risk disclosure: the sign of the economic impact and the measures used to communicate the expected performance. The economic sign is derived by counting the number of sentences that contain an indication of the sign of the expected impact over the total number of sentences in the MD&A (ECS). The type of measure used in communicating the expected impact is determined by using the ratio between the number of sentences containing a qualitative or a quantitative measure over the total number of sentences in the annual report (MSR). This ratio is weighted to differentiate the type of measure: a value of 1 is attributed to qualitative measures and a value of 2 is attributed to quantitative measures.

$$DPT_i = \frac{1}{rfl_i} \sum_{j=1}^{k_i} ECS_{ij} + \frac{1}{rfl_i} \sum_{j=1}^{k_i} MSR_{ij} \quad (3)$$

where DPT_i = depth index for company i ; rfl_i = number of risk items disclosed by company i ; k_j = number of sentences in annual report of company j ; $ECS_{ij} = 1$ if the sentence j in the annual report of company i contains information on expected future performance and $ECS_{ij} = 0$ otherwise; $MSR_{ij} = 2$ if the sentence j in the annual report of company i contains a quantitative measure of expected future performance, $MSR_{ij} = 1$ if the sentence j in the annual report of company i contains a qualitative measure of expected future performance, and $MSR_{ij} = 0$, otherwise.

The fourth dimension contributing to the definition of the risk communication profile is the *outlook profile*. This dimension concerns how management communicates the approach it adopted to face identified risks. As a matter of fact, risk disclosure can just communicate the existence of risks (or management's expectations concerning the future of the firm and its operating context) or illustrate the risk-management approach adopted by a company (by providing information about management programs or actions planned in order to face exposed risks). The index proposed (*outlook profile*—OPR) is presented in Eq. (4). The range of the OPR index is between 0 and 1: the index assumes higher values when a company discloses more information concerning actions taken or programs planned to face identified risks.

$$OPR_i = \frac{1}{rfl_i} \sum_{j=1}^{k_i} ACP_{ij} \quad (4)$$

where OPR_i = outlook profile index for company i ; rfl_i = number of risk items disclosed by company i ; k_j = number of sentences in annual report of company j ; $ACP_{ij} = 1$ if the

sentence j in the annual report of company i contains information concerning actions taken or programs planned to face identified risks and $ACP_{ij} = 0$, otherwise.

The framework and proposed indices can be used to analyze the firms' disclosures of risk from two different perspectives.

The first analysis perspective builds a synthetic measure of the quality of risk communication. To calculate this summary index, the four proposed indices are synthesized in an overall measure obtained as their simple arithmetic mean. They also have to be standardized to avoid a scale effect. In fact, they have different ranges of variation: density (DEN) and outlook profile (OPR) vary between 0 and 1; relative quantity (RQT) does not have a predefined variation range (it is distributed as a standardized normal); depth (DPT) may assume values between 0 and 3. To standardize these four indices, the following equation has been adopted (Eq. (5)).

$$IND_i^s = \frac{IND_i - \min_i(IND_i)}{\max_i(IND_i) - \min_i(IND_i)} \quad (5)$$

where IND_i^s = standardized index for company i ; IND_i = observed index for company i .

The summary index (Eq. (6)) that measures the quality of the risk disclosure by firms is obtained as follows:

$$QUALITY_i = \frac{1}{4} (RQT_i^s + DEN_i^s + DPT_i^s + OPR_i^s) \quad (6)$$

where RQT_i^s = standardized relative quantity for company i ; DEN_i^s = standardized density for company i ; DPT_i^s = standardized depth for company i ; and OPR_i^s = standardized outlook profile for company i .

The index obtained through Eq. (6) represents the quality of risk disclosure and can be used to rank companies. It offers an overall impression of how far the disclosure process has gone in different companies.

As always, when measuring complex phenomena like voluntary disclosure, it can be argued that while summary measures have their own usefulness because they collapse different perspectives into a single synthetic value, they have, at the same time, limited appeal (Beattie et al., 2002). The four indices can help profile the characteristics of disclosure offered by each company but, by its own nature, the summary index does not delineate the different risk-communication strategies adopted by each firm. For this reason, a second perspective is offered that integrates the four dimensions of analysis in order to depict the communication profile adopted by a firm in risk disclosure. A graphical representation of the risk-communication profile is obtained by arranging the four dimensions along two axes and by connecting the points that correspond to the measures reached in each of the dimensions (see Fig. 1).

The graphical representation of the risk-communication profile can help us to understand and compare the disclosures made by different companies. In Fig. 1, company BETA, with the maximum relative quantity of disclosure, makes a better disclosure than company ALFA, according to the traditional measure of disclosure suggested in the literature. Nonetheless, the quality of disclosure offered by company ALFA is better on the other three dimensions.

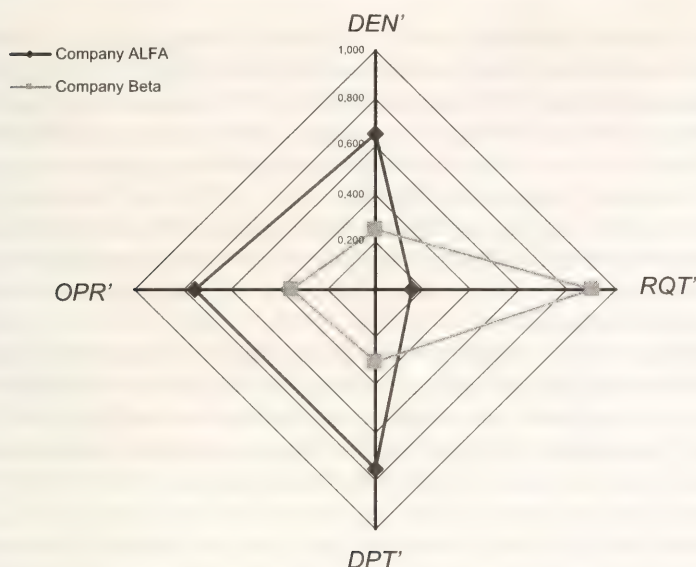


Fig. 1. The risk-profile diagram: visualizing risk-communication strategies.

The graphical capabilities of the proposed diagram limit its usefulness as a diagnostic tool. For example, it would be quite difficult to represent more than two or three companies (or groups of companies) on the same diagram at the same time. Given the limited number of *risk-communication profiles* that could be depicted at one time, the diagram could not be used to analyze long, historical series for the same firm, nor for comparing large populations of firms.

6. Research method

We conducted an empirical analysis to identify all the insights that a more articulated framework for the analysis of risk communication can capture compared to merely counting the number of disclosed items.

Our sample is drawn from all nonfinancial companies (chemical, clothing, electronic, food, media, transport, and utility) listed in the ordinary market of the Italian Stock Exchange at the end of 2001.¹ Because the Italian Stock Exchange does not regulate the disclosure of risks by nonfinancial companies, except for financial and market risks, almost all such disclosures by these companies are voluntary and, therefore, not driven by rules that can influence either the content of the disclosure or the way in which the information is presented.

We collected the data to be analyzed from company annual reports, an influential source of information because of its wide coverage and availability. In fact, Marston and

¹ To assure homogeneity of listing requirements, those companies listed in the Star Segment and the Nuovo Mercato Segment have been excluded from the analysis.

Shrives (1991) defined the annual report as the “main disclosure vehicle,” concluding that it is the most comprehensive financial report available to the public. Even if later empirical studies (Francis & Schipper, 1999; Lev & Zarowin, 1994) conclude that there is a decline in the relevance of financial information to investors, the annual report still offers, through narratives, information in addition to financial statements that explains accounting figures, sketches and presents perspectives (Beattie et al., 2002), and validates quantitative measures contained in the financial statements (Chugnh & Meador, 1984). Moreover, Lang and Lundholm (1993) showed that the disclosure level in annual reports is positively correlated with the amount of corporate disclosure communicated to the market and stakeholders using other media.

As the interest of our analysis was on voluntary disclosure, we focused more specifically on the MD&A. The method chosen for the analysis of MD&As is content analysis. It is a method widely adopted in corporate-disclosure studies (for a review, see Guthrie, Petty, Yongvanich, & Ricceri, in press) because it permits repeatability and valid inferences from data according to their context (Krippendorff, 1980).

The analysis was conducted by five researchers: two senior researchers, one senior research assistant, and two research assistants. We chose the sentence as the recording unit as it is considered a more reliable unit of analysis than the printed page or paragraph (Hackston & Milne, 1996). The coding procedure has been defined as follows: each sentence is coded as “no information” if it does not contain any risk information, and it is coded according to the elements of the framework (content, economic sign, type of measure, and outlook orientation) if it contains risk information.

On the basis of the framework, a list of detection and classification rules was defined and discussed with research assistants and classification criteria for each dimension of the framework were subsequently identified. Afterwards, a preliminary test of the coding procedure was conducted to highlight ambiguous or unclear coding rules and to standardize the classifying capabilities of the researchers: two annual reports of companies (excluded from the analysis) belonging to different industries were independently examined by the five researchers. The results of the individual classification were compared and the differences discussed. The outcome of this *pretest* activity was a final set of detection and classification rules. Using this set of rules, another annual report was coded by all the coders to test the alignment of the research team on the coding procedure. After validation of the procedure, each research assistant independently coded a subset of company annual reports. The five subsets were formed around the industry classification proposed by Borsa Italiana Spa (the Milan Stock Exchange ruling body).

When multiple coders are involved in content analysis, the reliability of the coding procedure has to be verified. Krippendorff (1980) identified three types of reliability: reproducibility, accuracy, and stability. *Reproducibility* refers to the assessment of coding errors when multiple coders are involved; *accuracy* compares the results of reliability obtained with a predefined standard set; and *stability* measures the reproducibility of the coding procedure across time.

Because the data gathered for this paper covered only one year, we address reproducibility. As a measure of reproducibility, the Alpha-agreement coefficient proposed by Krippendorff (1980) was calculated. The level of acceptance for Krippendorff *alpha* is a

Table 2

The reliability test: Krippendorff's alpha by category

	Content	Type of measures	Economic sign	Outlook profile
Alpha	.7511	.8970	.9288	.8619

value of .75 (Milne & Adler, 1999). Reproducibility of the analysis was tested via a sample of recording units analyzed by one senior researcher. The sample (5% of the total recording units) was drawn so that all coders and companies belonging to all industries were covered in order to identify coder subjectivity and industry bias. Because each sentence was analyzed from different perspectives, reproducibility was tested for each of the different dimensions of the coding framework. The Alpha Krippendorff was therefore calculated (Table 2). What emerges from the reliability test is that the Alpha Krippendorff is higher than the level of acceptance: only the index of the "what is reported" dimension is near the lower threshold.

7. Empirical evidence

Three areas of concern are addressed: first, an analysis of disclosure by risk factor; second, an analysis of the relations among risk factors and semantic properties, like economic sign, type of measures, and outlook orientation, that characterize the disclosures; and third, an empirical application of the multidimensional measure of the quality of risk communication. Table 3 presents some descriptive statistics concerning the disclosure of the risk factors considered by the proposed framework.

On average, an Italian listed company discloses 75 different risk items in its MD&A. The risk factors mainly concern strategy (35.9%), financial structure of the company (18.4%), and business processes (12.5%). Information about strategy refers to mission and broad objectives (67.3%), the way to achieve objectives (12.2%), the goals of performance (8.2%), and the ways to achieve results (5.3%). The disclosures concerning financial structure are mainly explanations of past financial results with some elements of prospective information (75%). These disclosures refer to economic-profit measures (55.3%) and financial-gearing indicators (19.7%). The disclosure explicitly related to projected-expected future results represents 20.1% of the information concerning financial structure.

Moving to the semantic properties of the information disclosed, only 15.5% contains some indications of the sign of the expected impact of future performance and the majority of these disclosures refer to the expected positive impact (10.3%). It should also be noted that the company with the highest level of disclosure on expected future performance does not disclose the sign in 39.9% of the information communicated. The same conclusions can be drawn for the measures adopted in disclosing information: over half of the disclosed information is not qualified by the estimation of expected impacts.

With respect to the outlook orientation, disclosed items are more focused on the present and the past than on the future. Almost half of the information released (49.5%) concerns the disclosure of action or decisions already taken in order to face risks, while management programs remain substantially undisclosed. In fact, only 16.2% of the items communicated

Table 3

Descriptive statistics: risk factors and semantic properties

		N	Mean	Minimum	Maximum	Standard deviation
Quantity	Disclosure	85	75.08	4	337	60.68
Content	Company characteristics		50.9			
	Financial structure	85	18.4	0	58	13.5
	Corporate structure	85	7.3	0		10.1
	Technological structure	85	7.1	0	25	5.3
	Organization	85	5.6	0	25	6.6
	Business processes	85	12.5	0	59.4	13.9
	Company strategy		35.9			
	Strategy	85	35.9	0	77.5	16.6
	Environment around the company		13.2			
	Environment: political, economic, financial, social, natural	85	3.5	0	25	5.4
	Industry	85	5	0	65.5	9.6
	Legal-regulatory	85	8.2	0	63.6	13.4
Economic sign	Negative	85	4.8	0	30.7	5.8
	Equal	85	0.4	0	6.2	1.1
	Positive	85	10.3	0	59	8.8
	Not disclosed	85	84.5	39.9	1	11.7
Type of measure	Financial		34.1			
	Quantitative	85	9	0	79.5	11.5
	Qualitative	85	25.1	0	80	16.8
	Nonfinancial		12.1			
	Qualitative	85	5.9	0	37.2	6.3
	Quantitative	85	6.2	0	30.5	7.2
	Not disclosed	85	53.8	6.1	90.9	18.5
Outlook orientation	Actions or decision taken	85	49.5	0	87.5	20.8
	Programs	85	16.2	0	57.5	13.2
	Hypothesis-expectations	85	14.9	0	75	12.8
	Actual state	85	19.4	0	76.8	17.7

pertain to information concerning risk-management programs. This kind of communication behavior represents a loss of the relevance of annual reports for external investors and other stakeholders.

The second type of insight comes from the analysis of the relation between the risk factors and the semantic properties that enrich the disclosure. In Tables 4 and 5, the relationship between risk factors and both economic sign and type of measures are analyzed. What emerges is an evident association in both cases (the chi-square test of association is statistically significant at the 1% level).

Table 4 shows, in addition to the clear evidence of nondisclosing behavior of the analyzed companies, that the information about expected future performance is disclosed more in

Table 4
Risk factors by economic sign

	Negative	Equal	Positive	Not Disclosed	Total
Financial structure	90	16	238	777	1121
	%	8.03	1.43	21.23	69.31
Corporate structure	20	1	53	470	544
	%	3.68	0.18	9.74	86.40
Technological structure	1	0	8	184	193
	%	0.52	0.00	4.15	95.34
Organization	1	0	15	339	355
	%	0.28	0.00	4.23	95.49
Business processes	15	0	91	550	656
	%	2.29	0.00	13.87	83.84
Strategy	86	6	161	2052	2305
	%	3.73	0.26	6.98	89.02
Environment: political, economic, financial, social, natural	28	1	32	178	239
	%	11.72	0.42	13.39	74.48
Industry	29	0	50	209	288
	%	10.07	0.00	17.36	72.57
Legal–regulatory	38	1	7	640	686
	%	5.54	0.15	1.02	93.29
Total	308	25	655	5399	6387
	%	4.82	0.39	10.26	84.53
Statistics	<i>df</i>		Value		<i>P</i> value
Chi-square	24		488.5671		< .0001
Cramer V			0.1557		

association with financial structure (30.69%), industry (27.43%), and external environment (25.42%), than with business processes (16.16%) and corporate structure (13.60%).

One of the most important dimensions of the disclosure of information assessing future performance is that pertaining to strategies. Although this dimension is relevant in driving the disclosure of analyzed companies, only 10.98% of the information explicitly disclose elements concerning expected impacts of future performance.

Looking at Table 5, we see the relative dominance of different types of languages in communicating business perspectives: financial measures (both qualitative and quantitative) dominate in the case of financial structures; in referring to industry and environment, nonfinancial measures typically prevail.

We derive some preliminary conclusions from the analysis made by using the proposed framework. First, analyzed firms voluntarily disclose some information concerning their future strategies but avoid communicating about their expected impact, not only in quantitative terms, but even in economic direction (expected profit or loss). Second, voluntary disclosure appears systematically biased towards management's self-justification of expected negative impacts: the rich disclosure of the expected limitations to business coming from new regulations is a clear symptom. Third, analyzed firms prefer to disclose

Table 5

Risk factors by type of measure

	Financial		Nonfinancial		Not disclosed	Total
	Qualitative	Quantitative	Qualitative	Quantitative		
Financial structure	353	475	36	34	223	1121
	%	31.49	42.37	3.21	3.03	19.89
Corporate structure	9	179	13	71	272	544
	%	1.65	32.90	2.39	13.05	50.00
Technological structure	2	57	6	6	122	193
	%	1.04	29.53	3.11	3.11	63.21
Organization	3	19	11	62	260	355
	%	0.85	5.35	3.10	17.46	73.24
Business processes	31	75	56	117	377	656
	%	4.73	11.43	8.54	17.84	57.47
Strategy	127	643	127	41	1367	2305
	%	5.51	27.90	5.51	1.78	59.31
Environment: political, economic, financial, social, natural	19	45	61	22	92	239
	%	7.95	18.83	25.52	9.21	38.49
Industry	12	48	63	30	135	288
	%	4.17	16.67	21.88	10.42	46.88
Legal–regulatory	19	63	5	12	587	686
	%	2.77	9.18	0.73	1.75	85.57
Total	575	1604	378	395	3435	6387
	%	9.00	25.11	5.92	6.18	53.78
Statistics	<i>df</i>		Value		<i>P</i> value	
Chi-square	32		2,115,884		<.0001	
Cramer V			0.2878			

management's thoughts and expectations on the future rather than to communicate the decisions and actions taken in the realm of risk management. Therefore, by using the semantic properties of the disclosure to deepen the analysis, it is possible to deduce that analyzed firms are clearly oriented towards a policy of "formal disclosure but substantial nondisclosure" of the expected impact of risk factors on future performance.

Besides the insights drawn from the analysis of risk factors in relation to their semantic properties, the framework for the analysis of risk communication allows us to evaluate the quantify of the disclosure according to the dimensions of *relative quantity*, *density*, *depth*, and *outlook profile*.

To evaluate the quality of disclosure using the traditional framework, some factors which determine the quantity of voluntary disclosure has been studied both in theoretical and empirical literature. While their effect over the quantity of disclosure appears controversial for the majority of them, it appears clear for two: size and industry (see Ahmed & Courtis, 1999; Belkaoui & Karpik, 1989; Cooke, 1989, 1992; Lang & Lundholm, 1993; Raffournier, 1995).

Regarding the size effect, Leftwich, Watts, and Zimmerman (1981) suggest that the proportion of outside capital tends to be higher for larger companies: because companies that borrow a higher proportion of their assets from banks tend to disclose more to meet the information needs of their lenders (Jensen & Meckling, 1976), it can be argued that size is a strong driver for disclosure. Moreover, Cooke (1989) argues that, as high level financial communication requires a wide variety of highly skilled individuals and the larger a company is, the higher its capability to attract these people, company size is an enabler for disclosure. Empirical evidence of the size effect has been offered in several studies (Adihikary & Tondkar, 1992; Ahmed & Courtis, 1999; Belkaoui & Kapik, 1989; Cooke, 1992; Firth, 1979; Healy & Palepu, 1994; Richardson & Welker, 2001; Robb et al., 2001).

With respect to the industry effect, Cooke (1992) reports that companies are pressed to disclose industry-related information in their annual reports by external investors who need to assess the company's relative position in an industry (Dye, 1985; Lev & Zarowin, 1999). However, disclosure within an industry may also be shaped by the behavior of a dominant company (Cooke, 1992). Historical reasons may cause a bandwagon effect (Cooke, 1989) and the international exposure of a particular industry might also affect the extent of disclosure (Raffournier, 1995). In the specific case of risk disclosure, the role of industry can be further emphasized because the technological and market constraints exerted by the competitive, industrial environment on business models significantly influence the risk profile of companies. Moreover, the types of risks a company faces are strictly related to both the unique critical-success factors and to the typical business models of an industry.

Table 6
Regression model for relative quantity

	<i>df</i>	<i>F</i> statistics	Prob > <i>F</i>	
Model	8	9.4	< .0001	
Error	76			
Total	84			
Adjusted <i>R</i> ²		.464		

	Parameter	Standard deviation	<i>t</i> Statistic	<i>P</i> value
Intercept	− 212.359	39.370	− 5.39	< .001**
Transport	− 4.903	18.882	− 0.26	.795
Electronic	19.670	16.792	− 0.26	.795
Clothing	2.843	16.292	0.17	.707
Food	8.445	22.381	0.38	.707
Utility	14.390	17.990	0.80	.426
Media	25.882	20.266	1.28	.205
Size	21.787	2.905	7.50	< .001**

**Significant at 1%.

$$\text{QNT} = \alpha_0 + \alpha_1 \times \text{transport} + \alpha_2 \times \text{electronic} + \alpha_3 \times \text{clothing} + \alpha_4 \times \text{food} + \alpha_5 \times \text{utility} + \alpha_6 \times \text{media} \\ + \alpha_7 \times \text{size}$$

QNT: amount of risk disclosure; transport, electronic, clothing, food, utility, media = 0 if company does not belong to the industry, = 1 if does; size = natural logarithm of turnover.

To verify that the proposed dimensions for analysis and the synthetic index are not influenced by factors as industry and size, an OLS model has been estimated for each of the dimensions. Referring to the *relative-quantity* dimension, it is independent from industry and size *per construction*. In fact, it corresponds to the standardized residuals of the regression where the dependent variable is the amount of disclosure and the independent variables represent size and industry factors.

The results of the regression (Table 6) confirm the findings of previous literature about the size effect while showing that industry is not statistically significant in explaining the amount of disclosure. As a consequence, absolute quantity can be used to rank firms belonging to different industries because the amount of disclosure does not depend on the sector in which a company operates.

The four indices obtained from the analysis of the MD&As were standardized according to Eq. (6) and the quality index has been calculated as their arithmetic mean. Table 7 contains the descriptive statistics of the four standardized components for the quality of the disclosure and the overall index.

The four standardized indices and the overall index can be used to rank companies. The cross-sectional comparison is particularly effective when disclosure is not regulated (as regulation influences the content and the modalities through which information is communicated) and when it is not driven by industry. Thus, it is important to verify to which extent the proposed indices depend on the factors identified in literature as drivers of voluntary disclosure.

Starting from the theoretical framework for the analysis of the disclosure of risks, four regression models were calculated: three models refer to three dimensions of the analysis of risk communication (*density*, *depth*, and *outlook*). The *relative quantity* was not considered because it is netted from size and industry effect *per construction*. The fourth model refers to the overall *quality* index. The independent variables of the regression models are size (the natural log of the turnover was used because the turnover was positively skewed) and the dummies (ind_i) representing the industry to which the companies belonged. The results of the regression models are presented in Table 8.

Some of the dimensions proposed for the analysis of risk disclosure reveal total independence from size and industry. The *density* and *outlook* regression models show that size and industry do not have any effect over each of these two indices. The statistical results of these models are not significant because the *F* test did not reject the null hypothesis ($P=.55$ and $.71$, respectively). As a consequence, the *density* and the *outlook*

Table 7
Descriptive statistics of the indices for assessing the quality of risk disclosure

Index (standardised)	N	Mean	Standard deviation	Minimum	Median	Maximum
RQT ^a	85	0.36482	0.15091	0	0.33014	1
DEN ^a	85	0.34925	0.22677	0	0.33796	1
DPT ^b	85	0.43335	0.19727	0	0.43417	1
OPR ^c	85	0.58491	0.24286	0	0.62895	1
Quality	85	0.43308	0.10082	0.21996	0.44821	0.67871

Table 8
Regression models for density, depth, and outlook profile

	DEN ^s				DPT ^s				OPR ^s			
	df	F statistics	Prob > F	P value	df	F statistics	Prob > F	P value	df	F statistics	Prob > F	P value
Model	8	0.84	.5561		8	2.78	.0126		8	0.65	0.7167	
Error	76				76				76			
Total	84				84				84			
Adjusted R ²		.0135				.1312				.0308		
Parameter	Standard deviation	t Statistic	P value	Parameter	Standard deviation	t Statistic	P value	Parameter	Standard deviation	t Statistic	P value	Parameter
Intercept	0.342	0.119	2.87	.005**	0.938	0.292	3.21	.019*	0.456	0.172	2.65	.009**
Transport	0.003	0.057	0.06	.949	0.060	0.140	0.43	.669	0.087	0.082	1.06	.292
Electronic	0.030	0.051	0.60	.547	–0.202	0.124	–1.63	.108	–0.019	0.073	0.26	.795
Clothing	0.012	0.049	0.25	.805	–0.052	0.120	–0.043	.665	0.046	0.071	–0.65	–.519
Food	0.091	0.067	1.34	.183	0.369	0.166	2.22	.290	–0.005	0.097	–0.06	.954
Utility	–0.052	0.054	–0.94	.339	–0.300	0.133	–2.25	.028*	0.050	0.078	0.64	.954
Media	0.067	0.061	1.10	.273	–0.036	0.150	–0.24	.807	0.012	0.088	0.14	.885
Size	–0.007	0.008	–0.83	.408	0.004	0.021	0.19	.847	0.014	0.012	1.17	.245

DEN^s = $\alpha_0 + \alpha_1 \times \text{transport} + \alpha_2 \times \text{electronic} + \alpha_3 \times \text{clothing} + \alpha_4 \times \text{food} + \alpha_5 \times \text{utility} + \alpha_6 \times \text{media} + \alpha_7 \times \text{size}$

DPT^s = $\alpha_0 + \alpha_1 \times \text{transport} + \alpha_2 \times \text{electronic} + \alpha_3 \times \text{clothing} + \alpha_4 \times \text{food} + \alpha_5 \times \text{utility} + \alpha_6 \times \text{media} + \alpha_7 \times \text{size}$

OPR^s = $\alpha_0 + \alpha_1 \times \text{transport} + \alpha_2 \times \text{electronic} + \alpha_3 \times \text{clothing} + \alpha_4 \times \text{food} + \alpha_5 \times \text{utility} + \alpha_6 \times \text{media} + \alpha_7 \times \text{size}$

DEN^s: standardized density index; DPT^s: standardized depth index; OPR^s: standardized outlook profile index; transport, electronic, clothing, food, utility, media = 0 if company does not belong to the industry, = 1 if it does; size = natural logarithm of turnover.

* Significant at 5%.

** Significant at 1%.

Table 9

Regression model for quality

	<i>df</i>	<i>F</i> statistics	Prob > <i>F</i>
Model	8	1.83	.09
Error	76		
Total	84		
Adjusted <i>R</i> ²		.1441	

	Parameter	Standard deviation	<i>t</i> Statistic	<i>P</i> value
Intercept	0.408	0.083	4.89	<.0001**
Transport	0.031	0.040	0.79	.430
Electronic	−0.002	0.035	0.61	.541
Clothing	−0.017	0.035	0.61	.541
Food	0.082	0.047	1.74	.085
Utility	0.047	0.038	1.25	.214
Media	0.024	0.042	0.58	.562
Size	0.002	0.006	0.33	.744

** Significant at 1%.

$$\text{Quality} = \alpha_0 + \alpha_1 \times \text{transport} + \alpha_2 \times \text{electronic} + \alpha_3 \times \text{clothing} + \alpha_4 \times \text{food} + \alpha_5 \times \text{utility} + \alpha_6 \times \text{media} \\ + \alpha_7 \times \text{size}$$

Quality: standardized index of risk disclosure quality; transport, electronic, clothing, food, utility, media = 0 if company does not belong to the industry, = 1 if it does; size = natural logarithm of turnover.

profile indices can be used to rank all the companies listed in this specific financial market independently from size and industry.

On the contrary, size and industry seem to be statistically significant in relation to *depth*. The depth regression model shows that two industries (utility and chemical) are statistically significant in regard to disclosure but not to size. The intense process of mergers and acquisitions that utilities have undergone during the last 5 years, as a consequence of the deregulation of the industry requested by Italian law, may explain this result. Additional qualitative and quantitative information on mergers and acquisitions are mandatory according to the requirements from Consob (the regulatory body of the Italian Stock Exchange).² Disclosure by chemical companies has a lower depth than disclosures by companies in other industries. This may be explained by the fact that all the chemical companies we analyzed also issue an additional *social and environmental annual report* in which the quantitative information disclosed mainly refers to business processes.

The regression of the index of *disclosure quality* (Table 9) shows that it is influenced neither by size nor by industry. It implies that this measure can be used to rank companies according to the quality of the disclosure of risks without any adjustment because the two main factors were to be drivers of disclosure behavior for listed companies.

² Regolamento di Attuazione del Decreto Legislativo del 24.2.1998, n. 58 (art. 71, Allegato 3A).

8. Conclusions

In this paper, we argue that, because the disclosure of risk is intrinsically narrative, the quantity of disclosure is not a satisfactory proxy for the quality of disclosure. We contend that, while sound disclosure should present the firm's situation and perspectives *through the eyes of management*, the quality of disclosure depends both on the *quantity* of information disclosed and on the *richness* of its content. We argue that richness is a function of the type of content disclosed (risk factors), the type of measures used to disclose the expected impacts of considered factors (type and economic sign of measures), and the approach management adopted to disclose identified risks.

A multidimensional framework for the analysis of the voluntary disclosure of risks that integrates all those dimensions is proposed. For each dimension, an index is calculated that offers a measure of the intensity of that aspect of communication. Considered together, the four indices can help profile the disclosure offered by a company. Thus, a diagram that graphically represents the risk-communication profile of a company is built by arranging the four dimensions along two axes. Moreover, an overall index of quality-of-risk communication is calculated that could potentially be used to rank companies.

To give substance to the proposed methodology for quality assessment, the framework was applied to the disclosure of risks made by Italian nonfinancial listed companies in their annual MD&A.

To verify that the proposed dimensions for analysis and synthetic index were not influenced by factors such as industry and size, an OLS model was calculated. The regression for the index of *disclosure quality* shows that it is not influenced either by size or industry. Thus, this synthetic measure can be used to rank the quality of the disclosure of risks without any adjustment for the two main factors recognized in the literature as powerful drivers of disclosure behavior of listed companies.

In conclusion, we firmly believe that the framework proposed here should be considered as a first attempt to align the methodologies used for the analysis of risk disclosure with the complexity of the issue, thus avoiding shortcuts represented by the mere counting of disclosed items. To refine the proposed framework and to improve its diagnostic properties, future research should address a few critical issues. First, an analysis of the strategies adopted by investors in analyzing risk disclosure is required to appreciate the relevance of the different dimensions considered. Second, the proposed framework should be applied to verify the extent to which the quality of risk disclosure is influenced by the degree of regulation imposed by external environment in which firms operate. Third, analysis should be conducted to verify if the proposed dimensions and the proposed synthetic index are related to the cost of capital.

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Discussion

Discussion of a framework for the analysis of firm risk communication

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1. Introduction

This paper represents an initial attempt to measure the quality of firms' risk disclosures. The paper contributes to the literature by eliciting a number of important questions. What defines disclosure quality? Is disclosure quality measurable? What information aids investors in their assessment of firm risk and how do investors use this information in developing their risk perceptions?

I commend Beretta and Bozzolan (BB) (Beretta & Bozzolan, 2004) for tackling two extraordinarily difficult issues: one related to the definition of disclosure quality and the other related to risk disclosure. However, the paper falls short of achieving its primary purpose—producing a framework for measuring risk-disclosure quality. In the following paragraphs I explain why.

2. What defines disclosure quality?

BB begin by stating that the quality of disclosure depends on the quantity of information disclosed and the richness of its content. As the paper progresses, BB further develop the concepts of quantity and richness, but for now, I wish to focus on their initial basic premise.

BB provide no support for the notion that $Quality = f(\text{quantity, richness of content})$. This is troubling since it is the crux of their proposed framework for measuring risk-disclosure quality. While it is true that no universally accepted notion of disclosure quality exists, the conceptual frameworks of the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) provide guidance regarding generally accepted notions of information quality (IASB, 1989; FASB, 1980). These well-known

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frameworks could provide the foundation needed to support a framework for assessing disclosure quality.

For example, the IASB framework identifies four qualitative characteristics of information that enhance the usefulness of information to economic decision makers: (1) understandability, (2) relevance, (3) reliability, and (4) comparability. Presumably, high-quality information is information that helps users make informed economic decisions. Accordingly, based on this, I offer the alternative premise that $Quality = f(\text{understandability, relevance, reliability, comparability})$.

Whether this or some other premise is employed, it is essential that the development of a framework for measuring-risk disclosure quality begin with well-supported and convincing discussions of the characteristics of information that define disclosure quality and why the characteristics selected are essential ingredients of disclosure quality. At present, BB's discussion does not exhibit the rigor required to support the development of a framework for assessing disclosure quality.

3. Is disclosure quality measurable?

BB suggest that their framework, which captures disclosure quality as opposed to quantity, overcomes the shortcomings associated with prior disclosure-measurement frameworks built upon counts of disclosure items. I contend, however, that all disclosure-measurement frameworks designed to date, including the BB framework, ultimately rest upon mere counts of disclosure items and the maintained hypothesis that quantity and quality are positively related. It may be that disclosure quality has defied direct measurement despite our best efforts to quantify it because disclosure quality is inherently immeasurable.

To illustrate the potentially insurmountable problems associated with any effort to quantify disclosure quality, I will begin with the premise that $Quality = f(\text{understandability, relevance, reliability, comparability})$. I focus on this premise because it has the advantage of being grounded in the IASB's and FASB's generally accepted conceptual frameworks, and, as discussed above, I believe it is critically important to begin with a well-supported premise of disclosure quality. However, concerns, similar to those expressed below, could also be offered to question the quantifiability of BB's notion of richness of content.

Consider first the qualitative characteristic of understandability. In assessing whether risk disclosures are understandable, one must first consider the question: Understandable to whom? For example, a researcher might assume that the relevant consumers of firms' risk disclosures are sophisticated investors. Alternatively, one might argue that high-quality risk disclosures are those that are understandable to less sophisticated investors. Different perspectives regarding the target group may lead to differences in instruments and/or cross-firm rankings of the understandability of firms' risk disclosures. Ultimately, the perspective adopted must be a function of the research question for which the disclosure rankings are developed. Thus, frameworks for assessing disclosure quality cannot be created in a vacuum, but must be created for use in addressing a particular research question.

Having identified the target group, to truly measure the degree of understandability of firms' risk disclosures to that group, one would have to design an instrument or procedure that allows the researcher to measure and quantify the essentially qualitative characteristic of understandability without resorting to mere counts of disclosure items. To do otherwise yields an instrument that captures disclosure quantity and then invokes the maintained hypothesis that quantity and quality are positively related in an attempt to produce a cross-firm ranking of the degree of understandability of risk disclosures. It is difficult to conceive of an instrument or procedure that measures the degree of understandability, does not incorporate counts of items, is not too subjective, and is not prohibitively costly to use.

Consider next the qualitative characteristic of relevance. Relevance is also a function of the user group of interest. Someone assessing the risk associated with an equity position in a firm may focus on risk disclosures that are irrelevant to someone assessing bankruptcy risk. Consequently, the researcher must begin by considering the question: Relevant to whom? And this determination must be made in the context of an immediate research question. Having identified the target group, the researcher must then have some idea of which risk disclosures are relevant, but presently, little evidence exists in the literature to guide this selection. Thus, before a researcher could attempt to design an instrument to measure risk-disclosure relevance, the researcher would have to undertake a study to identify which risk disclosures are the relevant ones to consider. Finally, the researcher would have to design an instrument or procedure that allows the researcher to measure and quantify the essentially qualitative characteristic of relevance without resorting to mere counts of disclosure items.

The third qualitative characteristic, reliability, may be the most difficult to assess. The IASB conceptual framework states that reliable information represents the underlying economics of the transaction faithfully, captures the economic substance of the transaction as opposed to its legal form, is free from bias, and complete within the bounds of materiality and cost. Thus, the researcher must be able to observe the underlying economics of the transaction before the researcher can assess the reliability of the firm's risk disclosure. Frequently, however, this information is not observable to parties external to the firm. Consequently, designing an instrument or procedure that allows the researcher to measure and quantify the essentially qualitative characteristic of reliability without resorting to mere counts of disclosure items may be impossible in many settings.

The final qualitative characteristic of disclosure quality that the IASB framework evokes is comparability. Higher quality risk disclosures are comparable across time for a given firm and comparable across firms at a given point in time. This suggests that the researcher undertake a time-series analysis of firms' risk-disclosure practices to assess the intertemporal comparability of those disclosures. Moreover, each firm's risk disclosures should be compared with some standard of disclosure (an industry norm, e.g.) to assess the cross-firm comparability of risk disclosures. Finally, these comparisons should employ more than a mere count of the items disclosed. Instead, the quality (i.e., degree of understandability, relevance, and reliability) of the risk disclosures should be compared in time series and cross-section.

In summary, quantifying the qualitative characteristics underlying disclosure quality is extraordinarily difficult for several reasons. First, the issue of what defines disclosure quality must be satisfactorily addressed. Second, the researcher must recognize that

effective frameworks for assessing disclosure quality are likely to be context specific. Finally, even if it is possible to conceive of a procedure for quantifying the attributes of disclosure quality, it may be virtually impossible to employ the procedure in an empirical setting due to lack of information, the need for excessive judgment, or prohibitive cost.

4. Does the BB framework capture disclosure quantity or quality?

I believe that a careful assessment of the measures comprising BB's disclosure-quality metric reveals that their framework is no different from the frameworks designed to date in the following important respect: BB's framework employs counts of disclosure items. Accordingly, the authors measure the quantity of disclosure provided and, consequently, must invoke the maintained hypothesis that quantity and quality are positively related if they wish to interpret their metric as a measure of disclosure quality.

BB's quality metric (QUALITY) is comprised of four components: relative quantity (RQT), density (DEN), depth (DPT), and outlook profile (OPR). RQT is the number of sentences in a firm's annual report containing risk disclosures in excess of the average number of such sentences provided by firms of the same size and in the same industry as the firm in question.¹ DEN is the number of sentences in the annual report containing risk disclosures, scaled by the number of sentences in the annual report. DPT is the sum of two ratios. The first ratio included in DPT is computed by dividing the number of sentences in the annual report containing forecast information by the number of risk items disclosed.² The second ratio included in DPT is computed by summing the number of sentences containing qualitative forecasts and twice the number of sentences containing quantitative forecasts and dividing the sum by the number of risk items disclosed. Finally, OPR is the ratio of the number of sentences that identify risk-related actions or programs to the number of risk items disclosed.

It is clear that each component of BB's quality metric is comprised of a scaled count of disclosure items. Thus, regardless of how the measure is described, it is clear that QUALITY is the outcome of a weighted count of the number of items disclosed. In this sense, BB's metric is no different from prior attempts to quantify disclosure levels, and, as such, it is inappropriate for BB to claim that their framework overcomes the shortcomings of prior attempts to assess disclosure quality by measuring the quantity of information provided.

¹ It is not entirely clear from the paper whether the authors consider the entire annual report in their analysis or limit their analysis to the MD&A. For example, in Section 5 of the paper in the discussion preceding Eq. (2), the authors state, "We define density of communication as the ratio between the number of sentences in which risk information is provided over the total number of sentences included in the MD&A (Eq. (2))." However, in their description of the variables employed in Eq. (2), the authors refer to the number of sentences in the annual report. This discrepancy also arises in the authors' discussion of their measure of depth found in Section 5. For purposes of my discussion, I assume that the authors considered the entire annual report when forming their sentence counts.

² It appears the authors use the phrases "risk items" and "sentences in the annual report containing risk disclosures" interchangeably.

5. From richness of content to density, depth, and outlook profile

The development of BB's framework from their initial premise that $\text{Quality} = f(\text{quantity and richness of content})$ to their empirical measure, QUALITY, which is based on the arithmetic mean of standardized values of RQT, DEN, DEP and OPR, is difficult to follow and is not sufficiently well developed. To illustrate, I will sketch out the development of BB's framework.

BB begin by stating that $\text{Richness of Content} = f(\text{semantic properties of information concerning future prospects})$. The link between risk disclosures and information about future prospects is not sufficiently well-developed in the paper. Perhaps my confusion stems from a lack of understanding of what BB mean when they use the term "risk." Are they referring to the nondiversifiable risk that a given investment presents? This is consistent with their statement in Section 2 that "Insufficient or inaccurate communication of existing risk and uncertainties by listed companies can severely undermine the capabilities of external investors to deal effectively with risk diversification in the management of their investment portfolios." But, if so, why is information concerning future prospects particularly helpful in assessing nondiversifiable risk? Or are they referring to the volatility of future cash flows, which may reflect both diversifiable and nondiversifiable risks? This is consistent with their statement in Section 3 that "Both CICA and ICAEW frameworks suggest to focus risk disclosure on the sources of uncertainties that affect volatility. . .". But again, if this is the case, why is information concerning future prospects helpful to investors in assessing the volatility as opposed to the level of future cash flows? Or are they referring to information that enhances investors' ability to forecast the level of future cash flows, which is consistent with the authors' statement in Section 2 that "The role of forward-looking information in voluntary disclosure has been found to be associated with a more accurate analysts' earnings forecasts. . .". But if this is the case, why is information useful in deriving a point estimate of a future outcome considered a "risk disclosure," when that term generally refers to the uncertainty (i.e., variance) of future cash flows as opposed to the level?

BB continue the development of their framework for the analysis of risk disclosures by stating, in Section 4, that $\text{Quality} = f(\text{content, economic sign, type of measure, outlook orientation})$. They then state that $\text{content} = f(\text{strategy, firm characteristics, technological structure, business processes, environment})$ and the semantic properties of information concerning future prospects $= f(\text{economic sign, type of measure})$. At this point, it is unclear whether outlook orientation is a semantic property of information or a different type of factor. Moreover, the critical link between each of the four factors (content, economic sign, type of measure, and outlook orientation) and their components and investors' assessment of risk is not entirely clear.

Continuing with the development of their framework, BB state in Section 5 that $\text{Quantity} = f(\text{quantity (strictu sensu), density})$ and $\text{semantic properties} = f(\text{depth, outlook profile})$, but throughout the development of the framework, the reader is left wondering why. Why is quantity a function of density? Why is depth or outlook profile a semantic property of information? Why does disclosure with these attributes inform investors' perceptions of risk? BB then go on to develop their empirical measures of quantity (strictu sensu), density, depth, and outlook profile based on scaled counts of various risk items

disclosed, but with little support for the move from theoretical construct to empirical measure. For example, density captures the extent to which risk-related information is dispersed throughout the financial statements corresponding to a “hiding the needle in the haystack” problem. BB measure density by taking the ratio of risk-disclosure sentences to the total number of sentences in the annual report, but is this an effective measure of the “needle in the haystack” effect? Perhaps density should be measured by computing the average number of non-risk-disclosure sentences between risk-disclosure sentences? How density should be measured empirically is not clear, and perhaps, the authors’ approach is the most appropriate, but at present, the authors provide insufficient support for the move from theoretical construct to empirical measure for this and their other variables.

At the end of the day, BB finds that their index of disclosure quality is not influenced by either the size of the firm or its industry membership. They conclude that their measure can be used to rank risk-disclosure quality without any adjustment for the two main effects identified in prior literature as “powerful drivers of the disclosures behavior of listed companies”. However, an alternative interpretation of BB’s finding is that given the issues discussed above, the resulting index fails to adequately capture cross-sectional variation in risk-disclosure quality and, for this reason, is not related to firm characteristics found in prior research to explain disclosure behavior.

6. Where do we go from here?

As I noted at the outset of my comments, this paper elicits a number of important questions related to disclosure quality. What defines disclosure quality? Is disclosure quality measurable? Is the maintained hypothesis that disclosure quantity and quality are positively related descriptive? These are critically important questions about which we know very little. They are worthy of careful assessment, and addressing these questions may represent a necessary next step in the advancement of disclosure research. I suspect that while some of these questions may be answerable in a general setting (e.g., What defines disclosure quality?), others and the development of frameworks for assessing disclosure quality must be addressed in the context of a specific research question.

This paper also elicits a number of important questions related to risk disclosure. What information aids investors in their assessment of risk? How do investors use this information in developing their risk perceptions? Do investors use risk disclosures to assess diversifiable risk, nondiversifiable risk, volatility of future cash flows, or in forming risk-adjusted forecasts of future cash flows? How do investors’ perceptions of risk impact stock price? These too are difficult but critically important questions to consider. But, these questions extend well beyond the boundaries of accounting research, such that it may be that some of them will be best addressed in partnership with researchers outside the field of accounting, in the field of behavioral finance for example.

In conclusion, I commend the authors for attempting an ambitious project related to the assessment of the quality of firm risk disclosures. I believe their paper will engender interest into the definition of disclosure quality and the assessment of risk disclosure. However, I believe much remains for future research to accomplish in terms of developing a framework for the analysis of firm risk communication.

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Discussion

Discussion of “A framework for the analysis of firm risk communication”

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1. Introduction

As a discussant of a conference paper, one is faced with the issue of writing up your discussion of the conference paper or with writing up a discussion of the revised postconference paper (sort of a moving target). Under the former strategy, some of the comments made at the conference are no longer relevant, as the revised paper has incorporated responses to these comments. In the latter strategy, the discussion could be extremely short if the paper has incorporated responses to many of the discussant comments. In this discussion, I use a mixed strategy—I present some of my comments from the conference and how these comments were addressed in the revision as well as some additional comments on the revised paper.

As I noted at the conference, I questioned why I agreed to act as a discussant on this paper—I have yet to conduct a voluntary-disclosure-based study and I have no work in the area of risk disclosures. About my only qualifications are that I am an archival empiricist and that also early in my career I proposed a new method of estimating corporate marginal tax rates using computer simulations.

2. Brief summary of the paper

The objective of the paper is to develop an index that measures a firm's voluntary disclosures about its risks. The index is composed of four elements that are aggregated into an overall measure between zero and four. The proposed index is illustrated by application to a sample of Italian firms. The motivation for the development of a disclosure index is that prior indices (e.g., Botosan, 1997) focus mostly on the quantity

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of disclosures (number of sentences or references to a particular disclosure issue). This is certainly a worthwhile motivation, and thus, the paper can be viewed as a methodological paper proposing a new methodology.

How does one evaluate a paper that proposes a new methodology? New methodologies are generally welcomed if they are easy to implement by other researchers and if they are valid measures of the underlying construct. Examples of widely cited new (at the time of their introduction) models are the simple market model in capital market studies, the residual-income model (Ohlson, 1995), the Jones discretionary accrual model (Jones, 1991), the simulated marginal corporate tax rate (Shevlin, 1991), and so forth. Note that the Botosan disclosure index approach has not been widely used because it requires extensive hand collection by the researcher. The proposed index in this paper requires even more extensive data collection and subjective judgment in its compilation. The simulated corporate marginal tax rate is very difficult to program and estimate. When approached by other tax researchers, I supplied the Fortran program that performed the simulations, but the general consensus was that the benefits were not worth the cost of learning the program. The approach really gained momentum when John Graham at Duke (Graham, 1996) posted his simulation estimates of marginal tax rates for a large-panel sample of U.S. corporations—this lowered the costs to researchers of using the methodology. In the corporate governance area, Gompers, Ishii, and Metrick (2001) have made available a measure of the power of top management relative to shareholders for a large sample of U.S. corporations in the 1990s (the G score). This score is currently being used by a number of researchers. Short of the current authors preparing and making available their disclosure index scores for a large sample of U.S. corporations, I conjecture, unfortunately, that the index will not be widely used. However, that does give the current authors the opportunity to exploit the index they have constructed on the current sample.

How does one validate a new methodology? There are a variety of ways—by analysis of the logic underlying the methodology, by comparing its results with other related or prior models, by simulation (e.g., Brown & Warner, 1980, 1985 evaluating event study methodologies; Dechow, Sloan, & Sweeney, 1995 and Kothari, Leone & Wasley, in press evaluating discretionary-accrual models), and by analytical analysis (Beaver, 1980, econometric properties of abnormal-return metrics). In this paper, the only way to really evaluate the construct validity of the index is by detailed analysis of the logic and components underlying the index. And because I do not have the background in this area, I will leave this task to others.

Many papers that propose a new methodology do so in the context of conducting a study in which the new method/measure/index is an integral part of the study (e.g., Jones, Shevlin, Botosan, etc.). That does not appear to be the case here. The index is proposed and developed, then illustrated by application to a sample of Italian firms; there is no testing of hypotheses about cross-sectional variation in firms' incentives and costs related to voluntary disclosure. Such an addition would substantially enhance the MS; however, this does leave the authors topics for future research with their index. In this regard, I think the authors will benefit by structuring the suggested extension around the costs and benefits of voluntary disclosure. The benefits include a

reduction in asymmetric information between the firm and investors such that the firm might lower its equity or debt cost of capital, a reduction in litigation risk or to explain poor performance, or managers might voluntarily disclose to reveal their managerial talent. Some costs related to voluntary disclosure are unexpected outcomes inconsistent with disclosures (possibly increasing litigation risk), provision of information useful to competitors, and, after attending this conference, uncertainty about how exactly to disclose (especially quantify) information about the risks facing the firm (e.g., see the papers by Ahmed, Beatty, & Bettinghaus, 2004; Christoffersen & Pelletier, 2003; Sribunnak & Wong, 2003). The conference paper contains a discussion about the costs and benefits of voluntary disclosure, but the discussion is fairly generic and not specific to voluntary disclosures about risks facing the firm. I think the discussion continues to need to be more specific about the voluntary disclosures of risk.

3. The index

The conference draft of the paper was somewhat difficult to follow in regard to the conceptual development of the index and its components, and the revision, while improved, is still a little difficult to follow. To aid the reader (and myself), I summarize what I perceive to be the framework. The authors argue, “attention has to be paid not only to *how much* is disclosed but also to *how* and *what* it is disclosed” (p. 7). They then develop their framework which considers four different dimensions (p. 7): “The *content* of information disclosed; the *economic sign* attributed to expected impacts; the *type of measures* used to quantify and qualify the expected impacts; the *outlook orientation* of risk communication; (the managerial approach to the management of risks.)” Content is further “redirected”(?) to three categories: (i) strategy (goals for performance, mission, broad objectives, and way to achieve objectives); (ii) company characteristics, such as financial structure, corporate structure (changes in ownerships, mergers, and acquisitions), technological structure, organization, and business processes; and (iii) environment around the company (legal and regulatory, political, economic, financial, social, natural, and industry). At this point, I think the authors have a very broad view of voluntary risk disclosures, and I would like to see examples of what they have in mind to make the discussion more concrete for, at least, this reader. I could envision nearly every sentence in a company’s MD&A section (the discussion used to construct each firm’s index) as being concerned with some element of the above three categories and dimensions.

Interwoven through the discussion here is the phrase/concept *semantic properties*, used to describe the economic sign and type of measure used to specify the economic sign. It is not clear that the phrase semantic properties adds anything to the development and discussion (other than to confuse me). Finally, outlook orientation is added to the index to capture “management’s approach to risks and the capabilities and resources devoted to it” (p. 7). The above discussion is summarized by the authors in their Table 1, which I found extremely helpful to help organize their discussion in the text.

After having presented the above framework, the authors then propose four empirical measures:

RQT—relative quantity of disclosures

DEN—density index

DPT—depth index

OPR—outlook profile index

RQT is the difference between the number of sentences of actual risk disclosure less the number predicted based on industry and size. DEN is the proportion of total sentences in the MD&A that are risk related. DPT is the sum of two components: the proportion of total risk-related sentences containing information on expected future performance and a summation of a variable coded two (one) if a sentence contains quantitative (qualitative) information on expected future performance (and zero if there is no risk disclosure). This latter sum is also deflated by the total number of risk-related sentences. Finally, OPR is the proportion of risk-related sentences containing information concerning actions taken or programs planned to face identified risks.

While one might think that these four measures map one-to-one into the four categories (content, economic sign, type of measures, and outlook orientation), this does not appear to be the case. RQT and DEN both relate to content. The term “semantic properties” reemerges but now covers type of measures and orientation of management. DPT captures the former, while OPR, as the name implies, relates to the latter (outlook orientation). That is, DPT captures the economic sign and type of measures. I would like to see a diagram or clearer links between the four empirical measures and the four categories. My point here is that while I think the empirical components of the index are all reasonable, I found a gap between these components and the underlying theoretical development—and recall that this is one approach to analyzing the validity of any proposed new measure. Nevertheless, I think that the index, conceptually and operationally, is a large step forward in the construction of a measure that researchers can use in voluntary-disclosure research.

The authors combine the four elements, after transforming each into variables in the range zero to one, by simply summing the four elements; thus, the elements are equally weighted. In the absence of any theory or compelling reason to do otherwise, equal weighting seems like a reasonable approach. The authors also present a figure graphically illustrating the four indices and showing how different conclusions (not surprisingly) might be arrived at using the four indices rather than just the quantity measure (RQT). In the conference version of the MS, much was made of the figure as a useful device to researchers examining voluntary disclosure—the geometric patterns can be compared across companies to infer disclosure strategies. While this is technically correct, such comparisons can only be meaningfully conducted on a small number of firms. In the revised version, the authors correctly point out that the graph has limited ability in large samples (across firms or across time) to help researchers analyze disclosure practices (e.g., how does one conduct significance tests on geometric patterns across a large number of firms?).

4. Empirical application

The authors then analyze the MD&A disclosures for 85 nonfinancial listed Italian firms. Italian firms are chosen not only because the authors are Italian but also because there is very little apparent regulation of the required disclosures on risk factors in the Italian market. Tables 3–6 present various descriptive statistics on the types of information underlying the compilation of the four components of the quality index. Distribution statistics on the components are given in Table 7, while Tables 8 and 9 present the regression results of each component and the overall quality index on industry dummies and firm size. While there are lots of data presented, it is not clear to me what the big takeaway is from much of these analyses. The regressions on industry and firm size are a start to examining cross-sectional variation in voluntary disclosure, but the two variables are not motivated via links to any hypotheses. I think the paper would benefit from more development of hypotheses about why we might expect cross-sectional variation in voluntary disclosure (and this would provide an indirect test of the validity of the index). Thus, a first extension is to develop a model explaining the firms' choice of the level of voluntary disclosure. A second extension is to examine whether firms' voluntary disclosures, as reflected in their index score, is associated with the firm's equity or debt cost of capital. In this regard, there are several issues to be considered. First, to be priced as a risk factor, it must be the case that investors cannot diversify the risk arising from differences in the voluntary disclosures. While some researchers question this assumption, Easley and O'Hara (in press) present a model where information risk is priced; also, see Francis, LaFond, Olsson, and Schipper (2004) for an application. Second, because the level of voluntary disclosure is a choice variable facing the firm, one has to be careful making cause and effect statements from observed empirical associations. Another way of stating this point is that the level of voluntary disclosure is an endogenous variable that needs to be modeled. Thus, this extension can use the model developed in the first extension. Third, as noted by Ittner and Larcker (2001), if firms are at equilibrium in their choice of disclosure, then we might reasonably expect no association between the firm's cost of capital and (1) the firm's predicted level of voluntary disclosure and (2) the level of voluntary disclosure after modeling (controlling) the underlying determinants of the firms' choice. This latter is equivalent to predicting no association between the cost of capital and the residuals (deviations of the actual from the predicted level of voluntary disclosure) from the first stage disclosure model. However, as noted by Ittner and Larcker, this is an extreme characterization, and if one thinks firms are not at equilibrium but are learning, then one might predict that it is costly to be off-equilibrium, such that there will be a positive association (increasing cost of capital) between the cost of capital and the absolute value of the residuals.

5. Concluding remarks

The authors are to be commended for thinking about, developing, and then spending the time to construct an index related to voluntary risk disclosures. The

underlying approach can be applied to other areas of voluntary disclosure. I encourage the authors to exploit their data set by (1) developing and testing predictions about the cross-sectional variation in the disclosure index (and possibly subsets of the disclosure index) and (2) examining whether the index is associated with firms' equity and debt cost of capital (as in Botosan, 1997) while noting the difficulty in conducting such tests.

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Reply

Reply to: Discussions of
“A framework for the analysis of firm
risk communication”

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The comments made by the discussants on our paper raise legitimate questions. While we agree with some of the remarks and will take advantage of the many useful suggestions in our future work, we leave it to the reader to utilize those comments as useful tools to critically analyze the content of our paper.

What we intend to do in the limited space of this reply section is to clarify some of the methodological issues underpinning the paper. In particular, we would like to briefly discuss two basic questions implicitly raised by the discussants. First: why did we center our framework on the denial that quantity is a sound proxy for quality of disclosure? Second: why did we feel the need to introduce the concept of “richness” in our framework when other generally accepted notions of information quality are already available?

Let us start with the first question. The analysis of the Management Discussion & Analysis (MD&A) sections of the annual reports released by the companies listed on major financial markets provides evidence of significant differences in the communication strategies pursued by different firms, both in terms of the content disclosed and how the content is presented. In particular, we analyzed the MD&As of a large number of companies listed on the Italian Stock Exchange. At the end of the analysis, we found for some firms that the MD&A section of the annual report did not add any knowledge to what we could get from the compulsory sections of the report. For other firms, the additional content and the way it was presented helped us gain a clearer view of the firm's situation and prospects. What struck us was also the fact that while some MD&As were able to concentrate, in a few pages, a variety of relevant information which helped us better appreciate the corporate risks pending on future results, other MD&As, that were hundreds of pages long, did not clarify those issues for the reader. This experience convinced us that disclosing more pieces of information did not make a disclosure more understandable or relevant. We examined several guides for the voluntary disclosure of

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financial information (AICPA, 1994; CICA, 2001; FASB, 2001; Wallman, 1995, 1996). One thing they all cited as important is the quality of narrative disclosure. It is seen as pivotal to the quality of overall institutional reporting. As is pointed out by the discussants of our paper, no universally accepted notion of disclosure quality exists. Nonetheless, we believe that issue is significant and deserves to be studied. Communication is a complex concept (Beattie, McInnes, & Fearnley, 2002); its measurement cannot be reduced to simple, single measures. We argue, therefore, that the one-dimensional approach to communication issues currently found in the literature—using the quantity of disclosure as a proxy for quality—cannot provide meaningful results for what is inherently a multidimensional concept.

To give substance to our tentative framework for the analysis of firm communication, we focus on risk communication and apply our multidimensional framework to the disclosure of risks made by Italian nonfinancial listed companies in their yearly MD&A. Our reasons for choosing the reporting issue and the population are discussed in the paper. On this point, we gratefully accept the suggestion to apply this multidimensional framework to other populations and areas of voluntary disclosure (possibly replicating the analysis on markets that have a longer tradition of voluntary disclosure than the Italian market), and to exploit our data set by developing and testing predictions about the cross-sectional variation in the disclosure index.

Coming to the second question, we felt that the qualitative characteristics of information suggested by generally accepted frameworks like “The Framework for the Preparation and Presentation of Financial Statements” (IASB, 1989) were too abstract to be operationalized. The problem of operationalizing general principles for purpose of measurement is not new (Solomons, 1986). It is a problem well known in the field of quality certification and total quality management: the principles suggested by standard setters (e.g., ISO) are defined broadly so they can offer guidance for most situations. But, to be of use in appreciating the effective quality of an operating system or of a business process, the standards need to be applicable to concrete attributes that can be measured (Lamprecht, 2000). We have attempted to provide a multidimensional framework based on four measurable attributes that can, to some extent, present the multifaceted nature of the quality of disclosure, while allowing at the same time an appreciation of the different strategies of communication adopted by different companies (the risk-profile diagram).

Again, we received some useful comments from the discussants. Like the discussants, we believe that one of the central issues of our methodological approach is the selection of the dimensions through which the quality of voluntary narrative disclosure can be assessed. Future research should address the issue of how to identify relevant dimensions that could integrate with or even substitute for the ones adopted in our proposed framework.

We also agree that the quality of voluntary disclosure should be defined from the user's perspective. In this regard, multidimensional frameworks should be based on a detailed analysis of the information needs expressed by specific segments of users on specific issues. This seems particularly important in the case of risk communication, given the multifaceted nature of risk.

In conclusion, we agree that our paper should be considered as an exploration of the topic a pioneering work and we are conscious of the fact that our choice not to adopt

consolidated approaches in favor of more experimental ones necessarily brings about some limitations—and opportunities for improvement. Some of the lines for future refinement (or even for rethinking) of the proposed framework are in the comments made by discussants. Others will come and will contribute to raising the quality of the debate and to moving towards better solutions.

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Referral as a determining factor for changing auditors in the Belgian auditing market: An empirical study

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Abstract

Traditional research on auditor choice and auditor switching focuses on company and audit (or) characteristics such as size and reputation, level of fees, or audit opinion. These studies seek causal relationship between changes in these characteristics and changes in auditor. This article claims that the conclusions of existing research have limited application to smaller companies in a small open economy like Belgium. We see a need to supplement the research model to reflect the fact that the decision to choose or switch auditors in subsidiary companies often occurs at the parent level and is determined by group characteristics rather than local characteristics of the subsidiary. In this article, we show that “referral,” the situation whereby the subsidiary—encouraged by the parent company—appoints the same auditor as the parent company, must be considered as an explanatory variable to understand audit-switching behavior in Belgium.

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Keywords: Audit switching; Referral; Subsidiaries

1. Introduction

The increased competition and dynamics of the external market for audit services has provoked the need to understand the reasons why companies change auditors. One motivation for the present study is that no previous research has ever dealt with this subject in Belgium, a country known to have a small open economy, where only a limited number of large companies exist and where many companies are subsidiaries owned by other companies (the parent company). Another motivation for this study is that previous international studies about the factors that determine a change of auditors rely on samples that mainly include large (e.g., Top 500, Fortune 1000) and/or listed companies. These

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studies ignore the possibility that small or medium-sized companies engage in specific audit-switching behavior as a result of their specific characteristics. Part of this oversight might be due to the assumption that these smaller entities were mainly subsidiaries of larger companies, and as such were audited by the parents' auditor and therefore would follow the parents' lead when switching auditors. Our empirical study shows, however, that this concept of "control unity" dominates but cannot be assumed automatically and less so in a cross-border setting. This study broadens to include all Belgian audited companies (not only large companies) and does not assume that control unity exists. We assume that enlarging the sample will help us gain a better understanding of the causes of auditor switching in Belgium and, by inference, many other small open economies.

This paper seeks to investigate the importance of referral in the Belgian audit market. In this article, *referral* is defined as the situation where "the subsidiary, encouraged by the parent company, appoints the same auditor as the parent company."¹ Two representations of referral are tested: (1) the referral conditions at a specific point in time and (2) the referral action causing audit switching. To test the first representation, a sample of audited companies was selected. The framework adopted for testing can be described as follows: Given that an audited company is a subsidiary, is the auditor of the subsidiary the same or does the auditor belong to the same (international) organization as the parent company?

Results from previous international literature indicate that changes of auditors are mainly initiated by the audited company and are due to some dissatisfaction with the former auditor: for example, an excessive audit fee, an unfavorable audit opinion, a professional error made by the auditor, a search for extra nonaudit services, or the reputation of the auditor. However, a subsidiary will often be limited in its ability to change or retain its auditors. The parent company, striving for control unity, is likely to appoint the same auditor for the subsidiary as for the parent company. Economies of scale and efficiency are obvious advantages. This referral behavior also suggests that if a parent company changes auditors the subsidiary will switch to the new auditor. Similarly, if a subsidiary is acquired by a new parent company, it will take the auditor of the new owner. Clearly, the initiator of the change in auditor is the parent company, not the subsidiary. To test our second representation, that referral is a determining factor in changing auditors, we gathered information from questionnaires completed by the financial managers of companies that changed auditors during a certain time period. The results of this second test reveal that the existence of a group relation and the ensuing referral behavior must be added to the list of characteristics that create conditions conducive to switching auditors.

The remainder of the paper is organized as follows. The next section reviews the literature on referral and auditor changes and defines the research questions. The research design is described in Section 3, followed by a discussion of the results (and their limitations) in Section 4. The final section summarizes the study and its principal conclusions.

¹ Cf. Cambridge, *The International Dictionary of English*: *referral* or *refer* to means "to send (someone or something) to (a different place or person having more knowledge and power) for information, help, a decision, etc." The referral concept is also used by the audit practitioners. The auditor of the parent company is granted a so-called "referral" fee if the auditor is able to "refer" the audit engagement of the subsidiary to an auditor belonging to the same (international) organization.

2. Theory, literature review, and hypothesis formulation

This section consists of three parts. The first reviews the reasons why a parent company is likely to encourage the subsidiary to appoint the same auditor as the parent company (referral). The second reviews the empirical evidence as well as some of the limitations of previous international studies on auditor change, and the third formulates the research questions to be tested.

2.1. Theoretical formulation

If a group relation between two audited firms exists, whereby one company (the subsidiary) is owned by another company (the parent company), one can justify the presence of “referral” behavior. In many cases, the auditor of the parent company will audit both the individual accounts of the parent company and the consolidated accounts of the group. These consolidated financial statements include data that are audited at the subsidiary level. Because of this group relation, parent companies strive for control unity. This offers obvious advantages such as economies of scale and efficiency to both the group and the auditor of the group. A single audit firm has a comparative advantage over a consortium of firms. It can prescribe uniform audit procedures, exercise a greater authority over auditors who are employees or partners, use a monitoring mechanism already in place, and present the client with a single, continuing firm rather than with a consortium that might be unstable (Benston, 1985). Thus, the parent company is likely to encourage the subsidiary to appoint the same auditor as the parent company. Davison, Stening, and Tan (1984) found evidence for this referral behavior. They conclude that most companies with interlocking directorates appoint the same auditor. The auditor of the parent company is often influential in persuading the parent company to strive for control unity. In addition to the efficiency advantages, the auditor of the parent company may be granted a so-called referral fee if he is able to “refer” the audit engagement of the subsidiary to an auditor belonging to the same (international) organization.

2.2. Empirical literature on auditor change

Previous international literature considers several factors that can be associated with “voluntary” auditor changes. A *voluntary* auditor change is defined in this paper as a change that is “initiated by the audited company.”

As depicted in Table 1, the empirical studies show a variety of variables related to an auditor change. The thinking of the most significant variable is not straightforward because the findings of these studies differ considerably. Differences in time periods, research methods, type, and nationality of the companies might explain these differences. The studies do show, however, a general trend. The *level of audit fees* seems in most studies a significant factor for changing auditors. *Disputes over accounting principles and audit opinion* on the other hand do not seem to be a significant determinant of auditor change. The studies also associate *changes in client ownership and/or management* with a higher likelihood of a subsequent change in auditors. The incumbent auditor is historically linked with former management, shareholders, or both. New managers and/or shareholders

Table 1

Summary of results of main empirical studies investigating the determinants of auditor changes based on multivariate analysis or questionnaires

Study author (year)	Sample definition	Sample size (<i>n</i>)	Variables tested surrounding auditor changes	
			Significant	Nonsignificant
Burton and Roberts (1967)	USA Fortune 500	137	Auditor merger Changes in management Additional audit services	Dispute over accounting principles Audit fees Company mergers Rotation policy New financing
Bedingfield and Loeb (1974)	USA, all listed companies	246	Audit fees Dissatisfaction with services provided by the auditor Company mergers Dispute over principles	Rotation policy Switch of audit partner
Eichenseher and Shields (1983)	USA, all listed companies	331	Audit fees Poor working relationships	Industry expertise
Addams and Davis (1994)	USA—INC. 500, All <i>non</i> listed companies		Dissatisfaction with services provided by the auditor Audit fees	Dispute over accounting principles Rotation policy/personal conflicts
Addams, Davis, and Mano (1996)	USA, all listed companies		Audit fees	
Marten (1995)	Germany, 4850 Unternehmen	237	Changes in shareholders/management Audit fees	Dispute over accounting principles
Beattie and Fearnley (1995)	United Kingdom, all listed companies	300	Audit fees Dissatisfaction with audit quality Changes in management Auditor mergers Company merger Switch of audit partner	Dispute over accounting principles
Williams (1988)	USA, all listed companies (intra Big-Eight auditor changes)	212	Industry expertise	Opinion shopping Client size

Table 1 (continued)

Study author (year)	Sample definition	Sample size (n)	Variables tested surrounding auditor changes	
			Significant	Nonsignificant
Haskins and Williams (1990)	USA, all listed companies (intra Big-Eight auditor changes)	209	Financial distress of the company Size and growth of the company Audit fee (companies with weak financial performance) Industry expertise	Audit opinion Initial public offering

often prefer another auditor with whom they had a favorable relationship in the past. Our study extends this area of research. We will, however, also consider changes at the ownership/parent company level and see how these changes—via referral related behavior—affect the auditor choice of the subsidiary company.²

Virtually all previous empirical studies base their studies on data from large and/or listed companies, a very small subset of the total number of audit clients. This makes the findings difficult to generalize to the population at large. Because prior studies have not considered smaller companies, many of which are subsidiaries owned by another company (the parent company), the referral phenomenon is neglected because these studies do not consider in detail the existence of a group relation between two audited firms, where one company (the subsidiary) is owned by another company (the parent company). Referral suggests a positive association between a takeover of a subsidiary by another parent company or a change in auditor in a parent company, both of which result in a subsidiary's involuntary change in auditor to the parent company's (new) auditor. We define an *involuntary* auditor change as a change that is "initiated by a company other than the audited company (e.g., parent company), whether or not the audited firm prefers the proposed change."

2.3. Focus of the present study

The previous sections have suggested that there are strong incentives for referral, but these incentives have not yet been empirically tested in depth. To determine whether this referral phenomenon is present and important in the Belgian auditing market, the following two research questions are tested:

(1) Given that an audited company is a subsidiary, is the auditor of the subsidiary in a given year the same as or belongs to the same (international) organization as the parent company?

² Some other reasons for voluntary auditor changes include the need for additional services, dissatisfaction with the (services of the) incumbent auditor, auditor or company mergers, regular rotation policy, and the switch or retirement of an audit partner. Francis and Wilson (1988) and DeFond (1992) also suggest that clients in anticipation or reaction to changes in agency conflicts seem to change auditors. Carpenter and Strawser (1971) and Menon and Williams (1991) found evidence that companies going public switch to a larger auditor with a better reputation than the incumbent auditor because it would add prestige and credibility of the financial statements. A change in the client's operational, financing, or investing characteristics may also result in an auditor change, as the production characteristics of the incumbent auditor may no longer be adapted to the changed characteristics of the client and consequently create inefficiencies (Gigler & Penno, 1995; Johnson & Lys, 1990).

If this question is answered in the positive, then strong support that referral takes place will have been found at a given point in time. Our sample of the Belgian auditing market illustrates that most Belgian firms are subsidiaries.

(2) Given an auditor change, is it initiated by the parent company who proposes its own auditor?

If this question is answered in the positive, then evidence will have been found that the referral condition is a determining factor in changing auditors. This evidence can also be used to gain a better understanding of the causes of auditor switching in many other small countries.

The present study differs from earlier research in one or more of the following ways. First, we broaden the research to all audited Belgian companies, not only the large and/or listed audited companies and, second, the tests developed in the present study allow for specific control of the referral phenomenon and involuntary auditor changes that have so far not been considered in the auditor change literature.

3. Research design

3.1. *Belgian auditing market and legal background*

According to Belgian Company Law, companies must appoint an auditor to express an opinion on the true and fair view of their financial statements, if these companies are “large,” that is, exceed at least two of the following criteria: turnover (excluding VAT) >6,250,000 euro, asset total >3,125,000 euro, and number of employees (yearly average) >50.³ These criteria need to be considered on a consolidated basis if the company belongs to a group that publishes consolidated statements or if the company is a holding or a listed company. If the total number of employees exceeds 100, the company is always considered to be large and must appoint an auditor even if the other criteria are not met. Companies that are not considered large are not obliged but have the option to appoint an auditor. Listed companies, whatever their size, are obliged to appoint an auditor.

In Belgium, auditors are appointed by the shareholders of a company for a 3-year period based on a proposal by the board of directors and with the approval of the Workers Council, if one exists. Previous research on dominating audit firms (Weets, 2000) shows that Big Six firms are important in the Belgian auditing market, especially for listed and affiliated companies. Weets (2000) indicates, however, the existence of a strong competition between these Big Six firms and other large non-Big Six audit firms. Concentration ratios in Belgium appear to be lower than in most other countries.

3.2. *Sample selection, data sources, and research model*

The first research question investigates the extent of referrals in the Belgian auditing market at a specific point in time and examines information regarding *Belgian subsidiaries*

³ These criteria are valid for financial statements ending from December 31, 1999. Criteria for financial statements ending December 31, 1994, till December 30, 1999, were turnover (excluding VAT) >4,957,870 euro, asset total >2,478,935 euro, and number of employees (yearly average) >50 [1 euro = 40.3399 Belgian francs as of December 31, 1999].

Table 2
Frequencies of country of origin of the parent company of Belgian subsidiaries

Country of origin	Frequencies	
Belgium	931	48%
The Netherlands	343	18%
France	162	8%
United States	117	6%
Germany	98	5%
United Kingdom	83	4%
Sweden	30	2%
Switzerland	29	2%
Japan	27	1%
Luxembourg	23	1%
Italy	16	1%
Finland	13	1%
Others	50	3%
Foreign	991	52%
Total	1922	100%

and their Belgian or foreign parent companies. The data for this research were collected from the national database of the Belgian National Bank (November 1997 edition) using the membership list of all auditors as of December 1995 and December 1996. The sample includes *mainly* trade companies governed by company law. Companies governed by special accounting regulations were not considered. In total, we obtained a list of 15,244 Belgian companies that appointed an auditor in the period 1993–1995/1996 (= Belgian auditing market). We then randomly⁴ selected 3555 of these companies and further investigated whether they were a subsidiary of a Belgian or foreign parent company.⁵ Of the 3555 companies, 242 were removed due to insufficient and/or outdated information.

Of the remaining 3313 companies, 1962 (or nearly 60%) appeared to be subsidiaries of Belgian or foreign parent companies, illustrating that subsidiaries represent the majority of the Belgian auditing market. This is a further indication that research on the extent to which parent companies extend their choice of auditor to their subsidiaries is relevant. Of the above 1962 companies, 40 were excluded from the investigation because the subsidiaries were in liquidation or the information regarding the parent companies was incomplete.

Further analysis of the parent company's country of origin for the remaining 1922 subsidiaries revealed that 48% or 931 subsidiaries had Belgian parent companies, whereas 52% or 991 subsidiaries had foreign parent companies. These foreign investors were mainly based in the Netherlands (18%), France (8%), United States (6%), Germany (5%), and the United Kingdom (4%) (Table 2).

To investigate whether and to what extent referral exists and parent companies encourage their subsidiaries to appoint the same auditor, we checked all selected subsidiaries to determine whether they had the same auditor or an auditor belonging to

⁴ Using the random function in Microsoft Excel (based on the VAT number), 4000 companies were selected out of the Belgian auditing market. Elimination of doubles resulted in a sample of 3555 companies.

⁵ In the disclosures of the financial statements, which are made public, Belgian companies are obliged to give information concerning their parent company (name and address), if any.

the same (international) organization as the parent company's auditor in the year 1995/1996. All subsidiaries were considered because a single parent company may not necessarily control all its subsidiaries in the same way.

Our test only considered the auditors of the individual (statutory) accounts and not the auditors of the consolidated accounts.⁶ This could bias (understate) our referral results because a local auditor might be chosen for individual and fiscal purposes, whereas the same (international) auditor might be chosen for consolidated accounts.

Using the Belgian national database, we found most Belgian parent companies' auditors (with exceptions due to incomplete and/or incorrect information).⁷ The identity of the foreign parent companies' auditors was obtained by contacting foreign professional organizations, examining specialized publications, and consulting the Internet. In addition, we sent out a questionnaire to 456 parent companies. We could identify the auditors of the related parent companies for 1434 (or 75%) of the subsidiaries. This includes 809 Belgian parent companies (out of a total of 933 or 87%) and 625 foreign parent companies (out of a total of 991 or 63%).⁸

To test our first research question we consider referral to exist "if, in a given year, the auditor of the subsidiary is the same or belongs to the same international organization as the auditor of the parent company." This survey only considers existing parent–subsidiary relationships and did not consider how these relationships were established (e.g., by takeover). Incidentally, situations can occur in which a parent company and a subsidiary have the same auditor, *without* the parent company having encouraged the subsidiary to appoint the same auditor as the parent company. In these cases, some "fake" referral could be observed. In our opinion, however, these cases and the resulting bias are very limited.

Sometimes companies (both parent and/or subsidiaries) appoint more than one auditor ("college of auditors"). If such a college of auditors is appointed, we consider a referral to exist if one of the auditors of the college of the parent company or subsidiary is the same or belongs to the same organization as the auditor of the parent company or subsidiary.

Audit firms belonging to an international organization do not always use their international brand name in the different countries in which they are located. Often they use their own local name. We identified the local representatives in the different countries for the different international Big Six and non–Big Six organizations. An overview of the local representatives for the leading auditing networks in Europe is included in Appendix A.

Next we examined the second representation, that is, the extent to which referral is a determining factor in changing auditors. The Belgian auditing market (slightly adjusted due to database inconsistencies for 15,968 companies who appointed an auditor in 1993–

⁶ Belgian companies are obliged to make up individual accounts without including subsidiaries (statutory accounts) as well as consolidated accounts including subsidiaries.

⁷ If the Belgian parent company appeared to be a bank or an insurance company, for which no information is included in the national database, other sources were used to identify the auditor (e.g., public annual report by the Board of Directors, Internet, or direct communication with the organization).

⁸ A bias can occur as a result of the way the auditor information was collected. We could identify the auditor for the majority (87%) of Belgian parent companies in our research. For the foreign parent companies, only 63% of the auditors could be identified. This data collection bias can lead to differences between Belgian and foreign referral percentages.

1995/1996 (see above)) was also the primary data source for this part of the study. A total of 1688 changes were found for the 15,968 companies in 1994 and 1995. This corresponds with a yearly average audit-switch rate of 5.3%.

To gather information on the rationale behind these changes of auditor, we conducted a mail survey in January 2000. The questionnaire (included in Appendix B) was sent to the financial controllers of all companies that switched auditors. They were asked to indicate the most important reason(s) for their auditor change out of a list of 14 possible reasons. This list was compiled based on the existing international literature, our referral results, and an in-depth examination of all structural changes on the supply side of the Belgian auditing industry. The 14 possible reasons take into account involuntary as well as voluntary changes. The involuntary changes include changes initiated by the parent company (referral) and the auditor. The voluntary changes include changes initiated by the audited company due to changes in management and/or shareholders and/or due to some dissatisfaction with the incumbent auditor (insufficient experience in the company's industry, limited supply of nonaudit services, not enough prestige, professional error, high audit fee, disagreement regarding accounting policies and audit opinion, not enough personal treatment). In addition, a blank space was left for additional remarks and other possible reasons.

4. Results

As demonstrated in Table 3, our survey revealed that 76% of Belgian subsidiaries have the same auditor or an auditor who belongs to the same international organization as the parent company's auditor. These results confirm the general assumption that parent companies encourage their subsidiaries to appoint the same auditor as the parent company.

Despite the generally high referral rate, important differences in referral rate are noted depending on the countries of origin of the parent companies. We notice a low referral rate in France, Germany, and Luxembourg (less than 50%) versus a high referral rate in Belgium, United Kingdom, United States, and the Netherlands (more than 70%). To determine whether the referral rate is dependent on the country of origin of the parent company we used the chi-square test. The observed value for the statistic amounts to 415.73. This is much higher than the expected value of 23.59 at the 0.5% significance level. This confirms that the country of origin of the parent country influences the referral rate.

A possible explanation for the differences in referral rate per country of origin of the parent company is the type of auditor (Big Six [B6]/non-Big Six [NB6]) the parent company appoints. In an international environment, referral can only occur if the parent company makes use of an audit firm with offices in the country of both the parent and the subsidiary. The most important international audit firms in the research period are the Big Six firms: Arthur Andersen, Coopers & Lybrand, Deloitte & Touche, Ernst & Young, KPMG, and Price Waterhouse. NB6 audit firms include local audit firms that are either fully independent or belong to an international NB6 audit organization.

Table 3 shows that 64% of the parent companies appointed a B6 audit firm. We also notice important differences in the type of auditor depending on the country of origin of the parent company. The most striking difference is found between Belgian and foreign parent companies. Whereas 87% of the foreign parent companies appoint a B6 audit firm,

Table 3

Descriptive statistics: referral results and type of auditor (B6/NB6)

Parent company, country of origin	Total number of subsidiaries	Referral (R) Nonreferral (NR)				Auditor parent company: B6/NB6			
		R	%	NR	%	B6	%	NB6	%
Belgium	809	677	84	132	16	365	45	444	55
						R	NR	R	NR
						306	59	371	73
						84%	16%	84%	16%
The Netherlands	234	166	70	68	30	208	89	26	11
France	88	39	44	49	56	67	76	21	24
United States	86	78	91	8	9	82	95	4	5
Germany	71	34	48	37	52	53	75	18	25
United Kingdom	58	42	72	16	28	55	95	3	5
Sweden	21	17	81	4	19	21	100	0	0
Luxembourg	12	4	33	8	67	9	75	3	25
Italy	11	7	64	4	36	10	91	1	9
Others	44	26	59	18	41	39	89	5	11
Foreign	625	413	66	212	34	454	87	81	13
						R	NR	R	NR
						396	148	17	64
						73%	27%	21%	79%
Total	1434	1090	76	344	24	909	64	525	36

the majority (55%) of Belgian parent companies appoints an NB6 audit firm. This result can probably be explained by the fact that companies investing abroad are normally larger than companies investing exclusively in their own home country. Moreover, a Belgian parent company with a Belgian subsidiary probably represents a national rather than an international group. It is most likely because of the compliance of production characteristics that national and smaller groups often appoint local and smaller audit firms.

For Belgian parent companies with Belgian subsidiaries, the international character of an auditor is less important within the framework of referral, because both parent company and subsidiary are in the same country. Our survey revealed that whether the Belgian parent company appoints a B6 or an NB6 auditor, referral occurs in 84% of the cases. The data for foreign parent companies are quite a different picture. Referral occurs in 73% of the cases in which the foreign parent company appoints a B6 auditor, and this figure drops to only 21% if the foreign parent company appoints a NB6 auditor, resulting in an average referral rate of 66% for all subsidiaries with a foreign parent company.

Whereas the majority of foreign parent companies (87%) appoint a B6 audit firm, Table 3 shows that there are material differences per country of origin of the parent company. In France, Germany, and Luxembourg only 75% of the parent companies appoint a B6 audit firm, whereas in the United Kingdom and the United States more than 95% of the parent companies appoint a B6 audit firm. A correlation between the country of origin and the type of auditor is confirmed by the results of the chi-square test. The observed value for the χ^2 statistic (excluding Belgium) amounts to 272.21. This is much higher than the expected value of 21.95 at the 0.5% significance level.

Table 4

Presence of the B6 audit firms in the United Kingdom, United States, and the Netherlands for parent companies included in our survey

Big Six	Roots Big Six	UK (%)	USA (%)	The Netherlands (%)
Arthur Andersen	USA	10	20	2
Coopers & Lybrand	UK–USA	24	20	33
Deloitte & Touche	UK–USA	9	14	9
Ernst & Young	UK–USA	22.5	23	15
KPMG	The Netherlands– Germany–UK–USA	22.5	11	28
Price Waterhouse	UK	7	7	2
Total		95	95	89

The fact that all B6 audit firms have an Anglo-American origin—with the exception of KPMG, which also has Dutch and German roots—may explain the noted country differences. Companies show a tendency to appoint audit firms with matching historical roots. This is illustrated by the fact that 95% of the UK and U.S. parent companies in our sample appoint an Anglo-American B6 audit firm (see Table 4). In the Netherlands, B6 audit firms also are well represented (89%). KPMG, the only audit office with Dutch roots, is strongly represented in the Dutch parent companies of our sample. Its presence is less strong in the United Kingdom and the United States.

The results of our sample, reported above, are in line with the results of other country surveys⁹ based on fee data of the audit firms. These surveys indicate that KPMG is the leading firm in the Netherlands, whereas Andersen (with pure American roots) was the leading firm in the United States.

The differences noted and the conclusions reached concerning B6/NB6 partly explain the existing differences in referral percentages per country of origin of the parent company. In France, Germany, and Luxembourg, we note a lower share of B6 audit firms as well as a lower referral percentage. In countries where the B6 audit firms are strongly represented (the United Kingdom, the United States, and the Netherlands) the referral percentage is the highest.

When interpreting the above (statutory) referral results, we need to consider some limitations. The noted referral results may be overstated or understated due to possible classification errors.

Despite our in-depth analysis to identify the local representatives in the different countries for the different international Big Six and non-Big Six organizations (see Appendix A), we could not confirm whether or not all NB6 audit firms belong to an international audit organization. Clearly, some do, but because we had insufficient data, they were all classified as independent, local, audit firms. It is possible, therefore, that some referrals would have been incorrectly classified as nonreferrals.

The understatement of referrals may also result from the short period under investigation (only 1 year). As mentioned earlier, Belgian auditors are appointed by the shareholders for a period of 3 years. Only certain legal reasons (e.g., grave error) authorize a company to

⁹ The Netherlands: *International Accounting Bulletin* (no. 214), September 12, 1997. UK: *International Accounting Bulletin* (no. 219), December 1, 1997. USA: *International Accounting Bulletin* (no. 202), February 17, 1997.

replace their auditor during that period. A takeover by another company or a change in parent company's auditor is not a legal reason to replace the auditor at the subsidiary level. Whereas some auditors voluntarily resign in favor of the (new) auditor suggested by the parent company, this is not a legal obligation. Some nonreferrals in our research are therefore the result of an auditor who refuses to resign during his 3-year mandate.

While we may have accounted for some of the nonreferrals in our survey, we cannot overlook the fact that despite the obvious advantages to having one audit firm for the group, still 24% of Belgian subsidiaries do not have the same auditor or an auditor who belongs to the same international organization as the parent company's auditor.

These nonreferrals may reflect the parent companies' granting their subsidiaries the independence to make some of their own decisions, including the choice of an auditor. The majority of these nonreferral subsidiaries have their own local management (general and finance administrators) and are not dominated by the management of their parent companies. A historical relationship of confidence between subsidiary and auditor confirms and continues this nonreferral¹⁰ situation. Some groups may "intentionally" install a consortium of auditors as they might opt for no transparency at all. In addition, group characteristics like size might explain a nonreferral behavior. If a group is considered small and is therefore exempted from the obligation to publish consolidated accounts, the advantages of referral are smaller. According to Belgian Company Law, groups are considered small and are not obliged to publish *consolidated* financial statements if they do not exceed more than two of the following criteria: turnover (excluding VAT) >25,000,000 euro; asset total >12,500,000 euro; and number of employees (yearly average) >250.¹¹ If the total number of employees exceeds 500, the group is always considered big. A more in-depth study of the prime reasons for a nonreferral situation could be an interesting topic for further research.

These results provide evidence that the Belgian auditing market consists of approximately 60% subsidiaries of which 76% is encouraged by their Belgian or foreign parent company to appoint the same auditor as the parent company. These figures shed a new light on audit switching behavior in small countries. In almost half of the Belgian cases, referral determines who will audit the Belgian company. Consequently, to understand audit switching in small countries, apart from the traditional rationale, we must also consider referral as an explaining variable.

The rationale behind auditor changing in Belgium, as collected from our mail survey, are reported in Table 5. (The response rate on the survey was 36%.¹²) The results of the

¹⁰ The reasons for nonreferral behavior are mainly based on the answers to a limited questionnaire sent to 20 nonreferral parent companies (response rate 30%). Considering the small sample size, one should be prudent in interpreting the results.

¹¹ These criteria are valid for Financial Statements starting from January 1, 2000 (1 euro = 40.3399 Belgian francs as of December 31, 1999).

¹² This response rate includes only useful answers. Blank and inconsistent responses were eliminated. To test for a nonresponse bias, we compared the answers of late respondents with the answers of early respondents, since the characteristics of late respondents can be compared with the characteristics of nonrespondents (Oppenheim, 1966). If the response of late respondents is similar to the response of early respondents, one can say that the nonresponse bias is limited. In our mail survey—at the 0.5% significance level—the null hypothesis for the similar distribution of response between late and early respondents could not be rejected. We could therefore accept that the nonresponse bias would not materially influence our results.

Table 5
Rationale behind auditor changing

Takeover by (another) parent company that proposed its auditor.	62.0%
Parent company switched auditor and proposed this new auditor.	30.0%
Striving for unity of control ^a	5.0%
The parent company's auditor changed its international affiliation and the parent company proposed the changed international affiliation's auditor.	3.0%
<i>Involuntary (referral)</i>	79%
Change in management and/or shareholders (physical person)	7.0%
Audit fee	3.3%
Supply of nonaudit services	2.5%
Personal treatment	1.9%
Professional error by the auditor	1.5%
Reputation of the auditor	1.2%
Experience in the company's industry	1.2%
No longer a subsidiary	1.0%
Opinion shopping	0.4%
Other reasons	1.0%
<i>Voluntary</i>	21%
Total	100%

^a In all cases of involuntary (referral) changes, the subsidiary, encouraged by the parent company, appointed the same auditor as the parent company and thereby established "control unity." In 5% of the referral changes this striving for "control unity," occurred, however, without a *current* change at the parent company's (auditor) level.

survey confirm that the referral condition is a determining factor in changing auditors—79% of the auditor changes were initiated by the parent company who proposed its own auditor to the subsidiary. Only 21% of all changes in auditors were determined by voluntary factors.¹³ These results are in line with a survey conducted by the Organization of Belgian Auditors (Instituut der Bedrijfsrevisoren-Institut des Reviseurs d'Entreprises, 1999), which indicated that the majority (72%) of Belgian management is very satisfied with their auditor. Only 3% of the Belgium managers questioned were dissatisfied with their current auditor. A legal prohibition on solicitation, a limitation on advertising by Belgian auditors, and the absence of public data on audit fees might partly explain this high satisfaction amongst managers. As managers are not fully informed of the services, quality, and prices offered by other auditors, the eagerness to change could be tempered.

The majority of the referral-related changes (62%) were the result of a takeover of a Belgian subsidiary by (another) parent company. The rest were almost all due to the parent company's change of auditor.

The larger part of the parent companies (68%) was foreign, indicating a higher takeover activity amongst international groups. As already noted above, Belgian parent companies with their Belgian subsidiaries represent national groups. In general, national groups are smaller and more often represent a family-owned business than international groups.

¹³ These results exclude the auditor-related changes due to structural changes at the supply side of the Belgian auditing market. An in-depth examination of all structural changes at the supply side of the Belgian auditing industry during the period 1988–1998 (i.e., mergers and acquisitions between audit firms, audit partners leaving the audit profession or transferring to another audit firm, etc.) showed that 38% of all changes were auditor related.

Moreover, the number of Belgian listed companies is very limited.¹⁴ The takeover activity of national groups might therefore be lower. The influence of national groups might also be the reason why in only 58% of the referral-related changes involving a Belgian parent company was a switch made toward (another) B6 audit firm. For foreign parent companies, a switch toward (another) B6 audit firm counted for 82%. This result confirms our earlier statement that for national groups the international character of an auditor is less important within the framework of referral, because both parent company and subsidiary are in the same country. In addition, the lower concentration ratios in Belgium might account for this result.

The main drivers for the limited share of voluntary changes of auditor were a change in management and/or shareholders (7%), the high audit fee (3.3%), and the limited supply of nonaudit services (2.5%). The evidence did not suggest that Belgian companies change auditors because of a qualified opinion (opinion shopping). A bias can influence our results, however, because companies might be reluctant to admit opinion shopping as a possible reason to change auditors. The development of a multivariate model to investigate the relation between an auditor change and an unfavorable audit report could resolve this bias.

The change in auditor due to a change in management and/or shareholder is in most cases not due to dissatisfaction with the current auditor but is merely the result of an historical relationship of confidence with previous auditors.

The audit fee as an explanatory variable for changing auditor might be due to strong regulations in the Belgian audit market. If the appointment of an auditor is a legal requirement, some companies might only appoint an auditor because they “have” to and not because they “want” to. For these companies, the cost of obtaining audit reports will prevail over quality.

5. Conclusion

Audit-switching behavior of Belgian companies cannot be fully explained using the traditional research approach. Local company and audit(or) characteristics do play a role. However, when a subsidiary–parent relationship exists, we find that referral behavior is an important and, in most cases, decisive determinant for auditor choice. First, we find that more than half the companies in Belgium have to accept—willingly or unwillingly—their parent company’s choice of auditor. Second, 8 out of 10 Belgian companies that switch auditors do not initiate this change, but, rather, follow a switch at the parent-company level. Whereas these results apply to the Belgian auditing market, it is reasonable to accept that similar results will be found in other small open economies.

Acknowledgements

We acknowledge the comments of the participants at the first EARNet Symposium (2001) in Wuppertal, Germany, and the participants of the 25th Annual Congress of the European Accounting Association (2002) in Copenhagen, Denmark.

¹⁴ As of June 30, 2000, the website of The Belgian Banking and Finance Commission mentioned only 204 Belgian listed companies.

Appendix A. Local representatives of international audit networks

International network ^a	Representative in					
	Belgium ^b	France ^c	Netherlands ^d	Germany ^e	UK ^f	USA ^g
<i>Big Six</i>						
KPMG	KPMG	KPMG	KPMG	KPMG Deutsche Treuhand	KPMG	KPMG Peat Marwick
Coopers & Lybrand	Coopers & Lybrand	Coopers & Lybrand (A.C.L.)	Coopers & Lybrand	C&L Deutsche Revision	Coopers & Lybrand	Coopers & Lybrand
Andersen Worldwide	Arthur Andersen (Marcel Asselberghs)	Barbier Frinault & Associés (Andersen Worldwide)	Arthur Andersen	Arthur Andersen	Arthur Andersen Worldwide	Arthur Andersen
Ernst & Young	Ernst & Young	Ernst & Young	Moret Ernst & Young	Schlag Ernst & Young	Ernst & Young	Ernst & Young
Deloitte & Touche Tohmatsu International	Deloitte & Touche (Timmermans, Pourbaix, Vacs)	Deloitte & Touche Tohmatsu	Deloitte & Touche	Wollen-Eimendorff Deutsche Industrie-Treuhand	Deloitte & Touche	Deloitte & Touche
Price Waterhouse	Price Waterhouse	Befee-Price Waterhouse	Price Waterhouse	Price Waterhouse	Price Waterhouse	Price Waterhouse
<i>Non Big Six</i>						
BDO	BDO	BDO Gendrot	BDO CampsObers	BDO Deutche Warentreuhand	BDO Stoy Hayward	BDO Seidman
Grant Thornton Moores Rowland	Lippens & Rabbacy	Amyot Exco Fidulor	Arenthals Chaudron Paardekooper & Hoffman	Falk & Co/Moores Rowland	Grant Thornton Brooking Knowles & Lawrence	Grant Thornton Baird Kurtz & Dobson/Dixon
						Odorn/Friedman
						Eisenstein Raemer & Schwartz/Hausser & Taylor/Moss Adams/
						MR Weiser/Wipfli
						Ullrich B'son

(continued on next page)

Appendix A (continued)

International network ^a	Representative in Belgium ^b	France ^c	Netherlands ^d	Germany ^e	UK ^f	USA ^g
<i>Non Big Six</i>						
RSM International	Nevens & Co	Salustro Reydel	Arenthals en Partners	Haarmann Hemmelrath & Partner	Robson Rhodes	McGladrey & Pullen
Euro-Defi	De Clercq/De Jonckheere/Van Impe en Partners/Michel Haag/Edward Bertels/Caluwaerts & Co	France Défi	Euro-Défi		Euro Defi UK	
Horwath International	Blancaert, Missorten, Spaenhoven & Co	Cabinet Cauvin Angleys Saint-Pierre	Walgenoed Accountants	AWT Allgemeine Wirtschaftstreuhand		Crowe Chizek/ Horwath David Berdon HLB International
HLB International	Peeters, Dupont & Partners	HLB Groupe France Audit Fiducial Expertise	HLB Nederland	HLB Treuhand		
Fiducial International					Westbury Schootness Neville Russell	Clifton Gunderson/ Goldstein Golub Kessler Pannell Kerr Forster
Nexia International		Calan Ramolino & Associés	Horlings Brouwer & Horlings	BTR Beratung und Treuhand Ring		
Pannell Kerr Foster (PKF)	Van der Steen, Riské, De Weert, Lelchvre & Partners	Pannell Kerr Forster France	Wallast	Schlage & Co/ Pannell Kerr Forster Societats Treuhand	Pannell Kerr Forster	
Moore Stephens	Van Havermaet	Groupe Concorde	Kantoor Van den Boomen Accountants		Morris & Rowland ^h	Moore Stephens North America

Summit International		Accountants en Belastingadviseurs Berk	Harzem & Partner/ DLHM Dornhof Leistner Hirsch Maerz	Alshuler Melvoin & Glasser/Cherry Bekaert & Holland/ Richard A Eisner/ Kemper CPA Group/ Larson Allen Weishair/Parente Randolph Orlando Carey/Rehmann Robson/Rubin Brown Gornstein/ Schenk & Associates Rothstein Kass
AGN International	Lison & Partners	De Roo Van der Veen	AGN Deutschland Gruppe	International Group of Accounting Firms
International Group of Accounting Firms API-Europe		Borrie & Co	International Group of Accounting Firms	International Group of Accounting Firms
Kreston International	Callens, Pirenne & Co	Alliott Peirson International Fiduciaire J-F Pissetaz/ Groupe fiduciaire Kreston/Cabinet Solis SA	Bansbach Schübel Brösztl & Partner/ Huppertz Walter Wirtz/Kleeberg und Partner/Westerfelhaus Müller Sandleben und Partner/Johannsen Basedow + Partner/ Gocher Treuhand Revisions.	International Kreston International Alliott Peirson International MacIntyre Hudson/Latham Crossley & Davis/Reeves & Neylan
BKR International	Callens, Pirenne & Co	Eurus France	Kooij + Partners	BKR International
Fidunion International		Groupe Fidunion	VWG Groep	

(continued on next page)

Appendix A (continued)

International network ^a	Representative in Belgium ^b	France ^c	Netherlands ^d	Germany ^e	UK ^f	USA ^g
<i>Non Big Six</i>						
DFK International	Deprez M. Rouvroy & Co (DMR)	DFK France	Accountantskantoor Fooderen BV	Peters Schanberger & Partner/DFK International Rödl & Partner		DFK International
CPA Associates International	Van Triest, Van Nieuwen, Lelieur, Van Ruyckeghem & Co			Hughes Allen		CPA Associates International

Blank: no local representative mentioned, for this international network, in the consulted sources.

^a *International Accounting Bulletin* (no. 207), April 25, 1997; "Leading Accounting and Auditing Networks in Europe Based on Fee Data," p. 7.

^b To date of our investigation no Belgian Survey exists. We based our information on several websites, audit reports, and interviews with the legal department of the Belgian Institute of Chartered Public Accountants.

^c *International Accounting Bulletin* (no. 210), June 12, 1997. The audit firms Mazars & Guérard, Euxex, and E3C are local audit firms that are not affiliated with an international network.

^d *International Accounting Bulletin* (no. 214), September 12, 1997.

^e *International Accounting Bulletin* (no. 227), April 30, 1998.

^f *International Accounting Bulletin* (no. 219), December 1, 1997.

^g *International Accounting Bulletin* (no. 202), February 17, 1997.

^h Based on questionnaire to parent companies.

Appendix B

- ☐ (1) Your company has been taken over by (another Belgian/ foreign *) parent company that proposed its auditor.
- ☐ (2) Your Belgian/ foreign (*) parent company switched auditor and proposed this new auditor.
- ☐ (3) The auditor of your Belgian/ foreign (*) parent company changed its international affiliation and the parent company proposed the changed international affiliation's auditor.
- ☐ (4) Your company is no longer a subsidiary and therefore voluntarily switched auditor.
- ☐ (5) Your company switched auditor due to a change in management.
- ☐ (6) Your company switched auditor due to a change in shareholders.
- ☐ (7) Your company preferred an auditor with more experience in your company's industry.
- ☐ (8) Your company preferred a larger supply of non-audit services (e.g. consulting, legal or tax advice).
- ☐ (9) Your company preferred to appoint an auditor with a better reputation.
- ☐ (10) Your incumbent auditor made a professional error.
- ☐ (11) Your incumbent auditor charged a high audit fee.
- ☐ (12) Your company disagreed with the incumbent auditor regarding accounting policies and audit opinion.
- ☐ (13) Your company preferred a more personal treatment and/or an audit team that remained the same.
- ☐ (14) Your incumbent auditor experienced a structural change (e.g. mergers) and acquisitions between audit firms, audit partners terminating their audit professions or transferring to another audit firm.

(15) Other reasons or remarks:

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.....

.....

*) Cross off what is not applicable.

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Book Review Section

The book review section is interested in works published in any language, as long as they are comparative or international in character. The author or publisher of such works should furnish the book review editor with two (2) copies of the work, including information about its price and the address where readers may write for copies. Reviews will be assigned by the book review editor. No unsolicited reviews will be accepted. Suggestions of works that might be reviewed are welcomed.

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Book reviews

Locating accounting in its national context: the case of Italy

By Stefano Zambon, Franco Angeli, viale Monza 106, 20127 Milano, Italy, 2002, 236 pp.

The author aims to provide with this book “an insider enquiry on a national accounting context taking as much as possible an ‘external’ and international perspective” (p. 20). The book is aimed primarily at an academic readership. The title suggests that as a piece of research, the work may be considered as a case study of one country, that is, Italy as an “empirical site.” In this connection, Yin (1994, pp. 38–40) states that single case study designs are justified in the following three kinds of circumstances:

1. The case is a critical case in testing a well-formulated theory;
2. The case is extreme or unique;
3. The case is ‘revelatory’ in that it deals with a phenomenon previously inaccessible to scientific investigation.

The author poses the question: why Italy? His answer is twofold. First, in spite of Italy’s leadership in accounting method during the late middle ages and the early modern period, and notably its role in disseminating double entry, present-day Italian accounting is depicted in the English language literature as “undeveloped,” “enigmatic,” or “jumbled and confused” (the author’s words, p. 17). This contrast, he says, makes Italy an interesting case for examination. But, second, according to him, such a depiction of present-day Italian accounting is inaccurate. The case of Italian accounting can thus be considered as unusual (if not extreme), and moreover, there exist widely accepted characterizations (if not a well-formulated theory) of present-day Italian accounting that are inaccurate and should be refuted. Ex ante, it seems fair to accept these reasons for writing the book as valid, and to judge it on the basis of how well it achieves its objectives of showing Italian accounting to be both interesting and, in its present-day manifestations, neither “undeveloped,” “enigmatic,” nor “jumbled and confused.” It should be noted that the book is essentially devoted to financial accounting or external financial reporting, rather than management accounting.

After an introductory chapter, which explains the book’s motivation, objectives, and structure, the book proceeds with a review of the English language literatures on comparative international accounting and on accounting from a critical perspective, that are relevant for the purpose of examining the case of Italian accounting in its national context. This is a meaty chapter, in which both literatures are criticized: the critical accounting literature for its lack of a comparative international perspective, and the

international accounting literature for its reductionism and lack of attention to social embeddedness, which result in its "offering crude and superficial notions of accounting diversity and the reasons for it" (Hopwood & Tsui, 1998, pp. iii, 55). It is argued that, as a result of these shortcomings, both literatures "run the risk of perpetuating and reinforcing national accounting stereotypes" (ibid.). Noting that some recent work, notably Puxty et al. (1987) and Willmott et al. (1992), suggests a blurring of the boundaries between the critical and the comparative, the author states that the book will seek to combine both approaches and "contribute to reducing the dearth of knowledge on the social functioning of accounting in a non-Anglo Saxon context" (p. 56). In my view, this second chapter well serves the purpose of indicating the kind of gap in the literature that a book such as this might seek to reduce.

After these two chapters, introductory in nature, there follow four "empirical" chapters dealing with what the author describes as "four loosely related aspects of accounting in Italy, ... selected [to]... represent a reasoned choice of subjects designed to offer a broad brush view of accounting phenomena in Italy" (p. 205). A brief concluding chapter ends the book.

Chapter 3 is devoted to the development of auditing in the Republic of Venice, from the late middle ages, through the early modern period until the fall of *La Serenissima* in 1797. The Venetian audit function described here was a public sector function; there is no mention of auditing (or accounting) in the private sector. Hence, although the chapter succeeds in showing the considerable technical development in Venetian public-sector accounting and auditing, and is interesting from an historical perspective, its relevance to present-day private-sector accounting in Italy is not clear. On the other hand, the fact that these developments were elicited by public-sector requirements serves to refute the view that accounting and auditing developed in response to the needs of capitalism.

I have long been intrigued by the Italian *Economia Aziendale* school of thought, which seeks to link accounting theory to microeconomic theories of the firm, and looked forward to reading chapter 4 (to which Luca Zan contributed) in order to increase my minuscule knowledge of this topic. I was, however, quite disappointed. The chapter is mainly concerned with how the conceptual boundaries of an accounting entity are set and the implications of this for calculating its financial result (income or profit). Thus, the ways in which these boundaries are considered in *Economia Aziendale* are compared to accounting theories of the firm in the English language literature, namely, various versions of the Proprietorship and Entity theories (there is no mention of Vatter's Fund Theory). I would have welcomed some comparison of *Economia Aziendale* with other approaches developed in Europe in the first half of the last century, in which accounting is integrated with a theory of the firm, such as those of Limperg, Schmidt, and Schmalenbach. A concluding remark in the chapter is, however, insightful: "The existence of distinct traditions seems to be based on the different ways in which the links between the theory of the firm, accounting theory and income measurement are construed which become locally entrenched and succeed in getting institutionalised within academic and professional accounting curricula" (p. 120). The chapter contributes to the overall argument of the book by casting a certain amount of light on this.

Chapter 5 deals with the reception in Italy of externally driven regulatory changes in financial reporting standards (the Fourth and Seventh EC Directives) and the recognition of professional audit qualifications (the Eighth Directive). By comparison with the "soft transformations" to the Fourth and Seventh Directives in Germany that were analyzed by Ordelheide (1990), the author refers to "*gattopardo* changes" in Italy (including those which the Eighth Directive was intended to bring about). *Gattopardo* changes (named after the celebrated novel by Tomaso di Lampedusa known as *The Leopard* in English) are superficial changes, the essential function of which is to allow matters at a deeper level to remain much the same.

The chapter is in fact concerned with, but does not highlight, a pervasive problem in the international harmonization of financial reporting: the dominant model of financial reporting (as exemplified to some extent in the EC Directives and to a much greater extent in the IASB's standards) originates in countries where medium- as well as large-sized companies typically look to the external market for equity capital and corporate governance follows the "outsider" model, so that "fair presentation" and decoupling from tax accounting are required for financial reports that are intended for outsiders. In contrast, in many of the countries whose financial reporting is supposed to be "harmonized," the external equity market is much less important, medium-sized and even many sizeable firms are largely family owned and rely for funding on a combination of retained profits and bank finance, corporate governance follows the "insider" model, and so there is little reason to consider the information needs of outsiders. Italy, as the author points out, is one of the latter countries.

A more detailed examination of the impact of international harmonization processes on financial reporting in Italy is given in chapter 6. This includes a comparison of financial report data produced by Italian companies using national accounting rules with data produced by them using U.S. GAAP and IASs. One important finding in this chapter is that in following national rules in the preparation of consolidated financial statements, Italian companies have frequently arrived at figures that are close to what would have been obtained using U.S. GAAP. This appears to have been a deliberate policy on the part of these companies, and it points to the way in which the flexibility of the Italian rules could be exploited to minimize divergences from U.S. GAAP. It is noteworthy, also, that towards the end of the 1990s, market forces were pushing such companies towards U.S. GAAP rather than IASs. Hence, as the author notes, market forces appear to have been a more potent influence in promoting the convergence of Italian financial reporting practices towards those that were internationally recognized, than *de jure* harmonization.

The brief final chapter returns to the question: why Italy? The author mentions the following contributions to knowledge made by the book:

1. An empirical contribution of descriptive material on accounting in Italy not hitherto available and thus contributing to a valuable empirical database;
2. A double theoretical contribution: first, the problematization of some taken-for-granted assumptions about accounting in general, notably that accounting (and auditing) developed in response to the needs of private capitalism—the example of Venice in chapter 3 shows otherwise; and second, the challenge to the notion (which according to the author is prevalent in Anglo-American accounting thought) that "accounting is just

about accounting," a view of accounting as a self-enclosed body of knowledge, rather than one that is intertwined with other bodies of knowledge, such as economics, law, sociology, and so on;

3. Finally, a methodological contribution through the portrayal of Italian accounting in its national and historical context, taking due account of the national factors in terms of which the characterizations of it as "undeveloped," "enigmatic," or "jumbled and confused" can be seen as ill informed, not to say crass.

I find myself in sympathy with most of these claims that the author makes for his book, but am not in complete agreement, as noted below.

In the first place, not all of these claims bear on the question: why Italy? The example of Venetian auditing apart, several other countries might have played a role similar to that in which the author casts Italy; for example, Ordelheide's Germany. Secondly, the view of accounting as a self-enclosed body of knowledge is not typical of present-day academics in English-speaking countries, although it may be true of accounting practitioners, and was certainly evident in the approach of the FASB in its conceptual framework project two decades ago (Archer, 1993, p. 99). Finally, I wonder whether there may not be diminishing returns from the preoccupation with the "social embeddedness" of accounting. Academics in the critical tradition have rendered invaluable service in pointing out how accounting, far from being a neutral set of techniques, can be (and often is) used as a tool by the powerful in society to pursue their own interests; in some ways, accounting is even more inaccessible to the less privileged than law. A functionalist approach to explicating the role of accounting in society is thus shown to be Panglossian¹, to say the least. But the international convergence of financial reporting rules and practices is taking place within a context of global markets in which competitive pressures extend beyond factor markets to the search for cheaper capital; and in that search, international accounting standards have a recognized role to play. The future role of "socially embedded" practices that hamper this search, especially without conferring any recognizable social benefits, is not so obvious.

Zambon's book is thought provoking, as well as being well written and well structured. I can recommend it as a worthwhile read for any academic or doctoral student interested in international accounting or accounting history. But I wish chapter 4 had lived up to my expectations.

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¹ After Dr Pangloss, a character in Voltaire's *Candide*, according to whom "all is for the best in the best of all possible worlds."

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International financial reporting and analysis

David Alexander, Anne Britton, and Ann Jorissen, Thomson Learning, London, UK, 2003, xiii+656 pp.

Beginning in 2005, companies listed in European Union countries will report to their shareholders and other external stakeholders according to international accounting standards and international financial reporting standards (hereafter, IAS). As the reporting and investing communities prepare for this event, the press is full of international accounting scandals, from Ahold Corporation in the Netherlands to Parmalat in Italy. Never has the need for clarity about accounting seemed so great.

Clarity about international accounting is precisely the aim of *International Financial Reporting and Analysis*, a new book focused directly on IAS and their application in Europe. The book is wide ranging in its topic coverage and, as the authors note in their Preface, not for beginners. It provides a broad overview of accounting history, theory, and standards, suitable for students with a firm foundation in basic accounting.

The first two parts dominate this four-part book. Part 1, "Framework, Theory and Regulation," contains 11 loosely connected chapters on topics often taught in accounting theory courses. Part 2, "Annual Financial Statements," examines 12 specific areas of accounting that would typically appear in intermediate accounting courses. Many of these chapters focus on individual international accounting standards. The final two parts, "Consolidated Accounts and the Multinational" and "Financial Analysis," respectively, consist of two chapters each. These provide brief introductions to topics often covered in advanced accounting and financial statement analysis courses.

The ambitious breadth of coverage makes it difficult to imagine completing the entire text in a single 13- to 15-week term. I suspect that most instructors so constrained will choose a subset of chapters to suit their needs, and that many will choose to focus on Parts 2 and 3, which present the actual IAS.

The authors position Part 1 as essential background for understanding IAS. I found it a mixed bag of historical details of external reporting in general and the

international harmonization effort in particular, articulation of theories of income and valuation, and characterizations of different systems of accounting. In some instances, I struggled to find the relevance for understanding how to use or analyze IAS. Does understanding how Hicks and Fisher defined income (pp. 58–62) help us understand how companies will apply IAS, how users will evaluate IAS disclosures, or how international standard-setters will make future choices? I believe that the time-pressed instructor will find whole chapters of the “Framework, Theory and Regulation” section expendable.

Parts 2 and 3 present IAS in topical fashion, and represent the heart of the text. I found the separation of Part 3, “Consolidated Accounts and the Multinational,” from Part 2, “Annual Financial Statements,” mysterious. Many consolidated entities operate within a single country, and many single-enterprise companies deal with foreign currency issues. Both logically and in format, these two parts of the book work as one. Within these two parts, I found the topic coverage good, and each chapter self-contained. Thus, an instructor can omit or reorder chapters within these parts relatively freely, with little fear of having omitted critical knowledge needed from another chapter.

Within chapters, the authors intersperse their own exposition of topics with frequent activities, that is, questions intended to engage the reader in active learning. Some activities are concept questions, like Activity 13.2 (p. 228): “Does goodwill on acquisition meet the IASB’s own definition of an asset?” Others ask for calculations, like Activity 20.6 (p. 368): “Calculate the actuarial value of accrued benefits for Mr. Dupont in each of the five years he is in service...” Activity feedback follows immediately after each activity, presenting the authors’ suggested response to the question. In this respect, I fear the activities will not function as the authors intend. Although the activities appear to invite the reader’s involvement, the immediate feedback serves as a disincentive to answer independently. I believe most students will nod along with the authors’ proposed response without first creating their own responses, and therefore without truly engaging in the learning activity. It is best, therefore, to regard the activities as illustrations, like the worked examples provided in most textbooks. Viewed in this way, they work well.

Each chapter ends with a set of exercises, for which the authors provide answers in a password-protected lecturer’s area of a companion website. I am a firm believer in the value of exercises that give students a chance to grapple independently with the content, and especially to work out the relations among accounts, as a means of cementing understanding. The exercises in this text ask students to recap concepts, not to work through mechanics, nor to interpret or analyze disclosures. I found myself wishing that the authors had held back a few of the activities for the ends of the chapters. I suspect that many instructors will want to supplement the text with their own exercises to ensure that students have some opportunity to work examples and perform analysis on their own.

Although the self-contained chapters, especially in Parts 2 and 3, offer instructors flexibility, I found the lack of real integration of ideas across the four parts of the text to be an area of weakness. Part 1 offers some intriguing discussions of how and why different countries’ generally accepted accounting principles differ. In Chapter 2 (pp. 22–37), the authors discuss how companies raise capital differently in different countries, how the legal and tax systems to which they are subject differ across borders, and how the cultural values that characterize different nations manifest themselves in their accounting regimes.

In Chapter 3 (pp. 40–42), they describe the limited success of European Union directives in creating uniformity of practice in the face of language, cultural, and legal differences. These ideas suggest that IAS may be implemented differently in different countries. This notion is absent from the discussion of specific IAS in Parts 2 and 3, which tend to describe accounting practice as if it will be homogeneous.

Part 4, "Financial Analysis," is another missed opportunity for integration. In two chapters, the authors present a very brief introduction to some financial analysis techniques, primarily ratio analysis. I found the relegation of the topic to two chapters at the end of the book disappointing, given the title of the book. In Part 1, the authors emphasize that accounting is a form of communication between companies and stakeholders. Why, then, segregate preparers' concerns in Parts 2 and 3 from users' concerns in Part 4?

In weakness we often find opportunity. I can imagine successful instructors supplementing this text with challenging, integrated, analysis exercises and examples of cross-border differences in application of IAS. Overall, I found *International Financial Reporting and Analysis* a well-timed and welcome addition to the library of international accounting texts.

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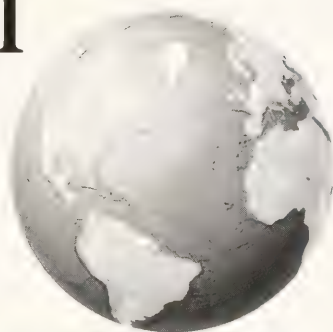


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Evidence from China on the value relevance of operating income vs. below-the-line items

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Abstract

This study investigates the value relevance of operating income vs. below-the-line items in the Chinese stock market. The motivations for this study are twofold. First, there is a need for empirical evidence of the value relevance of earnings components given that previous findings of value relevance in China at the aggregate level have often been questioned in the literature. Second, the reporting environment for earnings components in China provides an interesting opportunity to present additional evidence on the pricing of persistent vs. less persistent earnings. Chinese GAAP is more specific in defining the scope and specifying the format of reporting earnings components with different levels of persistence. In addition, differing from the U.S. evidence in the extant literature, below-the-line items in China is overwhelmingly income-increasing and frequently account for a large percentage of a firm's reported net income. By linking valuation analysis with earnings time-series properties, we present additional evidence to support value relevance in China: An earnings component is impounded in stock prices as long as it is persistent and nonpersistent below-the-line items are value irrelevant. However, the time-series properties of earnings components are not fully priced by the market. The earnings-response coefficients are larger for below-the-line items than for operating income, although below-the-line items are less persistent and have lower predictive power. In discussing this

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pricing anomaly, we identify some unique institutional factors that may be responsible for the results.

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Keywords: Value relevance of recurring vs. nonrecurring earnings; Special items; Below-the-line items; Earnings-response coefficients; Persistence of earnings

1. Introduction

The pricing of earnings components is of universal interest because generally accepted accounting principles (GAAP) around the world require reported earnings to be disaggregated into components in income statements. Explicitly or implicitly, perceived differences in persistence among earnings components are the primary basis for various schemes of decomposition. In recent years, special attention has been given to time-series properties and the pricing structure of recurring earnings vs. nonrecurring special items due to the increasing frequency and magnitude of such items reported in the United States¹ (Burgstahler, Jiambalvo, & Shevlin, 2002; DeAngelo, DeAngelo, & Skinner, 1992; Elliott & Hanna, 1996; Elliott & Shaw, 1988; Francis, Hanna, & Vincent, 1996; Hanna, 2001; Kinney & Trezevant, 1997; Moffitt & Rai, 2002). Evidence tends to show that the U.S. market places a higher valuation weight on recurring earnings than on special items. The international accounting literature contains a limited number of studies on earnings components (Giner & Reverte, 1999; Herrmann, Inoue, & Thomas, 2000; Herrmann, Inoue, & Thomas, 2001; Schadewitz, 1996).

This study investigates the pricing of operating income vs. items below operating income (below-the-line items)² in the Chinese stock market. Motivations for this study are twofold. First, there is a need for empirical evidence beyond the value relevance of aggregated accounting information in China. Due to the unique information environment, there has been a steady interest in the international accounting literature about if and/or how accounting information is reflected in stock prices in China (e.g., Abdel-khalik, Wong, & Wu, 1999; Bao & Chow, 1999; Chen, Chen, & Su, 2001; Eccher & Healy, 2000; Lee & Cao, 2002). Contrary to the expectations of many researchers, studies have consistently shown an association of accounting information with stock valuation to a degree similar to, if not stronger than, what has been documented in a mature market, such as the U.S. market. The evidence is often considered perplexing given the relatively short history of the stock market and accounting reform in China since the early 1990s. In

¹ Special items in the U.S. literature are not formally GAAP-specified line items in the income statement; instead, they are Compustat-defined items consisting of certain nonrecurring items identified from the income statement and the accompanying notes. Furthermore, the terms recurring vs. nonrecurring should not be taken literally; instead, they are better considered as describing different degrees of persistence because some special items occur year by year.

² All items below the operating-income line are generally considered less than recurring in China. While there is a large overlap between these items in China and special items in the United States, the scope of below-the-line items examined in this study is wider than that of special items in the U.S. literature. A more detailed discussion of the Chinese reporting environment will be provided in a later section.

addition to the value-relevance studies, many other papers have also provided detailed descriptions and analyses of events and developments related to Chinese accounting and stock markets (e.g., Chen, Sun, & Wang, 2002; and Chen & Yuan, 2001; DeFond, Wong, & Li, 2000; Xiang, 1998; Xiao, Zhang, Xie, 2000). A consensus of this literature is that the stock market in China is in its infancy, market-oriented accounting standards are still developing, and supporting infrastructure, such as preparer professionalism, quality auditing, and effective enforcement, is often inadequate. Apparently, the inconsistency between empirical and anecdotal evidence calls for additional research. Examining how market prices impound earnings components with different degrees of persistence is an important step in this direction; such a differential valuation implication requires a higher level of sophistication among market participants and a finer information environment in the market.

Second, the institutional environment surrounding the reporting of recurring vs. nonrecurring items in China is vastly different from that of the extant literature that is primarily based on the U.S. market. Chinese GAAP is more specific both in defining the scope of below-the-line items and in specifying the format of reporting them. As such, there is less ambiguity between earnings components that are supposed to be more or less persistent for users of the income statement. Furthermore, in sharp contrast to special items being dominated by charges to the income statement in the United States, reported below-the-line items in China are overwhelmingly income-increasing and often account for a large percentage of a firm's reported net income. Anecdotal evidence repeatedly suggests that using below-the-line items to increase earnings and meet profitability targets is a primary tool for earnings management in the Chinese stock market. Consequently, China offers an interesting opportunity to enhance the extant literature by examining how the stock market prices operating income vs. below-the-line items in a very different environment.

Based on four-year data from 1997 to 2000, we address three research questions. First, does the pricing of operating income and below-the-line items agree with perceived differences in persistence between these earnings components? Using a return and a price model, we find that both operating income and below-the-line items are value relevant, but contradictory to the perceived difference in persistence, price-earning multiples are significantly larger for below-the-line items than for operating income.

Second, are the time-series properties of the earnings components consistent with perceived differences in persistence? Based on an autoregression and a one-year-ahead earnings-prediction model, our findings confirm the theoretical and perceived patterns of persistence in the sense that recurring operating income is more persistent and has significantly larger predictive power than below-the-line items. However, different from many U.S.-based studies, we find that below-the-line items in China persist into the future and are of significant predictive values. We seem to have mixed evidence from the first two research questions about pricing mechanisms in the Chinese stock market. Pricing is rational in that persistent earnings, no matter whether they are recurring operating income or below-the-line items, are reflected in stock prices. However, the time-series properties of the earnings components are not fully impounded in stock prices as demonstrated by the unexpected relative magnitudes of earnings multiples.

Finally, is the evidence on persistence and pricing of below-the-line items interpretable? To answer this question, we identify various subsamples based on earnings-management

variables and observed persistence. For three earnings-management subsamples, we obtain some evidence consistent with stock prices properly reflecting time-series properties of below-the-line items. In particular, we find that below-the-line items resulting from the “big bath” do not have any valuation implications because they represent an interperiod transfer of expenses. For a sample of observations containing only transitory below-the-line items identified based on observed persistence, we provide strong evidence that nonpersistent below-the-line items are completely value irrelevant.

In sum, we find rational pricing of operating income and below-the-line items in China: An earnings component is impounded in stock prices as long as it is persistent and nonpersistent items are value irrelevant. Such evidence is important and casts an additional vote of confidence in the ability and sophistication of Chinese investors with respect to the use of accounting information. Despite the emerging nature of the stock market, less than fully developed accounting standards, and inadequate financial-reporting infrastructure, this study provides additional evidence to support value relevance in China. Not only do stock prices impound earnings information as demonstrated in many published studies, but they also reflect some differences in persistent vs. nonpersistent earnings as shown in this study. However, the study also shows that time-series properties of earnings components are not fully reflected in stock prices. Although below-the-line items are less persistent and have a lower predictive power than operating income, earnings multiples for these items are larger than that for operating income. This is an anomalous finding. Although we do not have direct evidence, we conjecture that the larger valuation weight placed by Chinese investors on below-the-line items may be due to the institutional environment in China where listed companies are somehow able to use these items to increase earnings whenever such a need arises. A more conclusive answer awaits future research.

The remainder of the paper is organized as follows. The next section discusses related literature, followed by a description of the institutional environment in China surrounding the reporting of below-the-line items. The fourth section describes data and the research design, followed by the fifth section where empirical results are presented and analyzed. The final section concludes the paper with a summary of findings.

2. Related literature on earnings components

Many studies of earnings components examine special items in the U.S. financial reporting environment. Elliott and Hanna (1996) examine the information content of earnings in the presence of large, multiple, nonrecurring charges. They find that earnings-response coefficients (ERCs) for earnings before special items decline following the recognition of large, special items and ERCs decline further after subsequent special items are reported. They also document a decline of ERCs for special items with an increasing frequency of special items and show that investors attach significantly less weight to special items than to earnings before special items. Their interpretation of the findings is that these special write-offs may be viewed by investors as being finite-horizon as opposed to recurring events and/or as being associated with unusual and difficult-to-interpret economic circumstances. A recent study by Moffitt and Rai (2002) reexamines the results

of Elliott and Hanna using both seasonal random walk and analysts' forecasts to estimate expected earnings. They find that ERCs for earnings before special items decline first, but then rise as the frequency of special items increases. However, they fail to document any stable patterns for ERCs on special items.

Elliott and Shaw (1988) find a significant one- and two-day industry-adjusted negative return around the write-off announcement and an association of these negative returns with the size of write-offs. Francis et al. (1996) attempt to examine whether the stock-price reactions to write-off announcements depend on the nature of write-offs. Although their overall tests show negative market reactions to the write-off announcements, suggesting that the market responses are driven by write-offs revealing information about asset impairment, they find that investors' responses become significantly positive to restructuring charges, which is interpreted as conveying information about future improvement in performance. Both Elliot and Shaw and Francis et al. focus on the stock-price reaction to write-off-type special items without examining the relationship between pricing of recurring earnings vs. special items.

Several studies examine the time-series relationship between special items and reported or forecasted earnings without attempting to explore the pricing aspect of special items. DeAngelo et al. (1992) investigate the effect of special items on the time-series properties of earnings and find a negative association of current-period special items and next-period annual earnings, suggesting an interperiod transfer relationship between special items and future earnings. Kinney and Trezevant (1997) document firms' differential reporting behavior with respect to positive vs. negative special items. They find that negative special items are more likely to be reported separately in the income statement to emphasize their transitory nature; however, positive special items tend to be reported together with others and discussed in notes to de-emphasize their transitory nature. Hanna (2001) examines the impact of special items on analysts' earnings forecasts and finds an increasing error in analysts' forecasts when special items exist.

Burgstahler et al. (2002) simultaneously examine the time-series properties and stock market pricing of recurring earnings vs. special items. Focusing on quarterly earnings, they demonstrate that special items are less persistent than other earnings components, and show significant differences between the time-series properties of positive vs. negative special items in that negative special items are more than completely transitory, reflecting interperiod transfers, while positive special items are not completely transitory. With respect to pricing, they find that the market recognizes differences in time-series properties between special items and other earnings components as well as between positive and negative special items. However, stock prices do not fully impound the information of time-series properties in either special items or other earnings components, suggesting irrational pricing mechanisms in the U.S. market.

Research on pricing and/or time-series properties of earnings components is both scarce and less focused in the international accounting literature. Using Spanish data, Giner and Reverte (1999) find that the separate disclosure of extraordinary earnings³ does not

³ As in many other countries, extraordinary items in Spain are much broader than the narrow definition adopted by U.S. GAAP. Most, if not all, of the Compustat-defined special items would be included as extraordinary items.

provide incremental information beyond aggregate earnings. Herrmann et al. (2000) report extraordinary items in Japan to be less persistent than either operating or nonoperating income. But neither study directly examines the pricing of recurring vs. nonrecurring earnings. Schadewitz (1996) investigates the information content of interim earnings components based on Finnish data and finds higher earnings-response coefficients for perceived permanent earnings than for perceived transitory earnings. However, the study does not make a direct connection between pricing and the time-series properties of earnings components. Different from other studies, Herrmann et al. (2001) examine both the time-series properties and stock-market pricing of parent earnings vs. subsidiary earnings in Japan. Although subsidiary earnings are found to be more persistent than parent earnings, this persistence in subsidiary earnings appears to be ignored by the Japanese stock market.

Similar in spirit to Burgstahler et al. (2002), this current study connects the pricing of operating income vs. below-the-line items to their time-series properties to examine whether prices reflect observed differences in persistence between these earnings components. Applying a different research design to the institutional environment in China, we provide new evidence to the international accounting literature. The findings of this study help improve the understanding of how market participants use income-statement information to price earnings components with different levels of persistence.

3. Institutional environment in China

3.1. Stock market and accounting information

China opened the Shanghai and Shenzhen Stock Exchanges in late 1990 and early 1991, respectively. Listed companies were originally authorized to issue only A-shares to domestic investors. In 1992, some companies, most of which had already issued A-shares, started to issue B-shares to overseas investors. While A-shares are traded in Renminbi, B-shares are traded in U.S. dollars on the Shanghai Exchange and Hong Kong dollars on the Shenzhen Exchange. Since the establishment of the stock exchanges, the equity capital market has grown rapidly in China. By the end of 2000, which is the last year of the period covered in this study, the two stock exchanges had 955 listed companies issuing only A-shares, 86 with both A- and B-shares, and 28 with only B-shares.

The overwhelming majority of the listed companies were formerly stated-owned enterprises, and the Chinese government has normally retained a majority ownership in these firms after the initial public offering. The rapid development of the market, coupled with weak corporate governance due to government dominance in ownership, has created an environment prone to repeated corporate and/or market scandals in recent years, such as insider trading and fraudulent financial reporting. In addition, as compared with mature markets, the history of the Chinese market has not been sufficiently long to allow capital-market infrastructure, including professional intermediaries and legal rights and investor protection, to fully develop. Many papers in recent years (e.g., Abdel-khalik et al., 1999; Chen et al., 2001; Eccher & Healy, 2000; Xiang, 1998; Xiao et al., 2000) have identified these problems that impede efficient operation of the capital market in China.

The development of the stock market has been a driving force behind accounting reforms. Before the 1990s, the purpose of Chinese accounting systems was to provide information to help safeguard state assets and facilitate centralized planning and control, with a focus on tangible measures, such as physical assets, production outputs, and appropriations and uses of the state funds. Profitability was never an emphasis of the pre-stock-market era accounting in China. The formation of the stock market created a need for value-relevant accounting information to help equity capital flow to the most efficient uses, and thus, started the process of accounting reform that is still going on today. In 1992, the Chinese government issued *Accounting Regulations for Experimental Listed Companies*, which moved away from the traditional fund-based accounting model and incorporated many Western accounting practices reflected in International Accounting Standards (IAS). To further move Chinese accounting in line with IAS, a revised regulation, *Accounting Regulations for Listed Companies*, was issued in 1998 to supersede the 1992 experimental regulation. The success of the 1998 regulation in harmonizing Chinese GAAP with IAS was well recognized both inside and outside China (Chen et al., 2002). Two years later, in 2000, the government further revised and expanded the 1998 regulation and issued *Accounting Regulations for Business Enterprises*, which governs financial accounting and reporting of all business enterprises (listed or not listed).

Although China has made remarkable progress in standard setting within a relatively short period of time, many lingering problems exist in the areas of information environment and the infrastructure necessary for the production and dissemination of high-quality accounting information. As analyzed in many papers (e.g., Abdel-khalik et al., 1999; Chen et al., 2001; Chen et al., 2002; DeFond et al., 2000; Eccher & Healy, 2000; Xiang, 1998; Xiao et al., 2000), these problems primarily include weak corporate governance, lack of qualified accountants and professionalism, low-quality auditing, and ineffective regulatory enforcement. As a result, the quality of accounting information in China has been generally perceived as low in the literature. The different reporting requirements for A- and B-shares imposed by the Chinese government implicitly recognize this perception. While A-share annual reports are based on Chinese GAAP audited by local CPA firms, B-share reports are required to follow IAS, typically audited by large international firms, presumably to ease overseas investors' concerns over the lack of quality in Chinese GAAP-based annual reports.

These well-recognized problems in the stock market and financial reporting lead to two conjectures in the extant literature: (1) Value relevance of accounting information in the Chinese market should be lower than what has been observed in mature markets; and (2) Value relevance is higher for IAS-based B-share reports than for Chinese GAAP-based A-share reports. However, empirical studies (e.g., Abdel-khalik et al., 1999; Bao & Chow, 1999; Chen et al., 2001; Eccher & Healy, 2000; Haw et al., 1998; Lee & Cao, 2002), using data from different years and various valuation models, have provided consistent evidence that contradicts both expectations. Given the suboptimal information environment, researchers are typically perplexed and unwilling to accept the results as evidence for the value relevance of accounting information in China; instead, various interpretations and conjectures, some of which disagree with each other, have been offered in the literature.

Evidently, more research is needed. One way to provide additional evidence is to examine the value relevance of disaggregated accounting information instead of aggregated earnings and/or book value of equity as done in previous research. Our current study makes an effort in this regard. Since operating income and below-the-line items are supposed to differ in persistence, this difference should be reflected in stock prices if the pricing mechanism in China properly impounds accounting information. Differential pricing of earnings components based on different levels of persistence requires investors to have higher sophistication and accounting information to be of higher quality. Consequently, such evidence will provide additional support for value relevance in China beyond previous studies.

3.2. Reporting of earnings components

As reviewed earlier, the extant literature on pricing and time-series properties of earnings components is primarily based on U.S. data. However, income statements in the United States do not unambiguously separate persistent earnings from nonpersistent earnings components. Officially, extraordinary items and discontinued operations are separately reported as nonrecurring items on the face of the income statement. An item that is infrequent but not unusual is classified as nonoperating income part of income from continuing operations. However, companies are required under APB No. 30 to report material events or transactions that are either unusual or infrequent as separate line items of income from continuing operations, presumably to help users better distinguish recurring from nonrecurring earnings. These separately reported line items are the basis of the Compustat data item “special items” that has been the subject of many studies reviewed earlier. Although there is a growing concern about how these items should be reported, there has been no GAAP to formally define these special items. No wonder practice varies with respect to reporting special items (Kinney & Trezevant, 1997). Compustat’s own definition includes such items as restructuring charges, current-year results of discontinued operations, natural-disaster losses, and nonrecurring gains or losses from the sales of assets, investments, and securities. Evidently, the composition of special items is heavily influenced by management discretion about which items are reported as separate line items.⁴

⁴ Ironically, the ambiguity regarding recurring vs. nonrecurring earnings in the U.S. income statement is a consequence of standard-setting efforts. APB Opinion No.9 (1963) was the initial U.S. GAAP in which extraordinary items were broadly defined to include events and transactions that would not be expected to recur frequently such as gains or losses from the sale or abandonment of a plant or a significant segment of the business, gains or losses from the sale of an investment not held for resale, the write-off of goodwill owing to unusual events, the condemnation or expropriation of properties, and major devaluations of currencies in a foreign country where the company was operating. Reporting abuses during the next ten years led to a review of extraordinary items in 1973 and the promulgation of APB Opinion No. 30 (1973) that substantially narrowed the scope of extraordinary items to only events and transaction that are both unusual in nature and infrequent in occurrence. Furthermore, the board specifically excluded several transactions from extraordinary items, such as write-downs of receivables, inventories, equipment leased to others, deferred research and development costs, or other intangible assets; gains or losses in foreign currency transactions or devaluations; gains or losses on disposals of segments of a business; other gains or losses on the sale or abandonment of property, plant, and equipment used in the business; effects of strikes; and adjustments of accruals on long-term contracts.

The ambiguity of distinguishing persistent from nonpersistent earnings components seems less likely in China because Chinese GAAP takes a current-operating-performance approach to income reporting and specifies operating income as recurring persistent earnings, and all other items below the operating income line as less persistent or nonrecurring components. Specifically, four below-the-line items, including investment income, government subsidy, nonoperating revenues, and nonoperating expenses, are required to be separately reported after operating income. Presumably, this format better helps users distinguish recurring from nonrecurring or less persistent earnings.⁵

Investment income is related to all income or loss from external investments, including dividend income, interest income from debt securities, gains or losses from disposal of investments, and valuation adjustments. Government subsidy results from the unique ownership and social-political structure in China. Because the state is the majority shareholder, local governments often view the number of listed companies in their jurisdictions as an indicator of performance and are motivated to provide assistance of various types to listed companies, especially those in financial difficulty. Specific forms of subsidy may include direct financial subsidies from local governments or state-owned enterprises acting as the majority shareholders, various tax exemptions or refunds, and debts forgiven by state-owned majority shareholders. Nonoperating income and expenses include most of the other items not included in the previous two categories, such as asset overages and shortages, gains or losses from asset disposals, revaluation gains or losses, debt restructuring gains or losses, donations received or given, approved write-offs of payables, and other irregular losses.

There are many similarities between below-the-line items in China and special items in the United States, although the scope of below-the-line items is wider than that of special items.⁶ In addition, reported frequencies of positive vs. negative items are substantially different between the two markets. A majority of the studies reviewed earlier examine negative special items. Even for studies of both positive and negative items, composition tilts significantly toward more negative special items. For example, 78.49% of the material special items in the sample of Burgstahler et al. (2002) are negative. In comparison, below-the-line items in China are overwhelmingly positive. In this current study, about 80% of the below-the-line items are positive, with both the mean and median statistics of positive items substantially larger than negative items.

The primary reason for overwhelmingly positive below-the-line items is that listed companies are under tremendous pressure to improve profitability due to several unique

⁵ Some of the special items in the United States are not even reported as separate line items in the income statement; instead, they are discussed in the accompanying notes. Conceivably, it is not a trivial matter for a user to come up with a single total amount of special items as reported by Compustat.

⁶ Arguably, there are some below-the-line items that may be recurring year after year such as investment income. Even so, they may still differ from operating income in persistence. Operating income comes from the primary operations of the business that are determined by its long-term mix of capital deployment, while "recurring" below-the-line items can be easily changed by short-term managerial decisions. Consequently, the ability to predict the business's long-term profitability should be different between the two and this difference should be reflected in prices if the pricing mechanisms are efficient. In fact, some of the special items in the U.S. literature are not transitory one-time items anymore. For example, it is well known that some companies take restructuring charges, a major special item, several years in a row for a long period of time.

institutional factors. First, the controlling shareholders of listed companies are either state-owned enterprises or government agencies, both of which rely heavily on earnings to evaluate performance of listed companies. The tenure, promotion, and political future of top management depend on earnings performance in the eyes of controlling shareholders (Chen et al., 2001; DeFond et al., 2000; Xiao et al., 2000). Second, many listed companies run into financial difficulty soon after an IPO, creating urgent incentives to use noncore activities to improve the bottom-line figure (Aharney, Lee, & Wong, 2000; Lee & Cao, 2002). Third, Chinese security regulations contain explicit profitability targets that govern the eligibility for raising additional capital through rights offering or determining delisting status, leading to strong incentives for earnings management (Chen et al., 2001; Chen & Yuan, 2001; DeFond et al., 2000; Lee & Cao, 2002). Finally, a documented lack of quality auditing (DeFond et al., 2000; Xiang, 1998; Xiao et al., 2000) may further exacerbate earnings management. There have been many cases reported in the Chinese media and/or accounting literature that describe how listed companies use below-the-line items to manage earnings to a desired level within this unique environment (e.g., Wei, Tan, & Lin, 2000, pp. 178–190; Zhou & Jiang, 2001). Consequently, we expect a significant difference in persistence between operating income and below-the-line items. Given the clear-cut reporting format, this difference in time-series properties should be reflected in stock prices if pricing mechanisms are efficient.

4. Data and research methodology

The data used in this study is taken from the Taiwan Economic Journal (TEJ) China Database. All listed A-share companies with sufficient information over a four-year period from 1997 to 2000 are included in the study, resulting in a total of 2202 firm-year observations after deleting extreme and outlying values.⁷ Since only A-share companies are sampled, all market data are based on A-share prices, while accounting variables are from Chinese GAAP financial statements. Both stock splits and stock dividends have been adjusted in the TEJ database. Although Chinese GAAP specifies four below-the-line items, the TEJ database reports asset revaluation gains or losses (REV) separately from nonoperating income and expenses, and also includes a residual item (OTH) to report anything that cannot be easily classified.

Table 1 presents descriptive information for each of the below-the-line items. Both the frequency and magnitude of positive vs. negative items clearly demonstrate the tendency of Chinese listed companies to use below-the-line items to increase the bottom line. For example, about 80% of below-the-line items are positive, and both the mean and median statistics, either scaled by income before tax or by total assets, indicate that positive items

⁷ We took two steps to ensure that extreme and outlying observations would not unduly influence our results. First, we deleted observations outside five standard deviations from a mean for each variable in Table 2. A total of 2420 firm-year observations were available after this procedure. Second, both the return and price models in Table 4 were estimated for each of the four years, and an observation was further deleted if the absolute value of the Standardized Residual was greater than three or Cook's Distance greater than one, which led to the final sample of 2202 observations in this study.

Table 1
Reported below-the-line items in China

Reported below the line roots in China								
Frequency (%)				Scaling variable	Magnitude in %			
			Mean		Median			
	<i>N</i>	<0	>0		<0	>0	<0	>0
INV	1964	328	1636	NI	−10.37	138.11	−0.82	10.47
		(16.70)	(83.30)	TA	−0.64	1.26	−0.14	0.61
SUB	1048	8	1040	NI	−6.40	21.13	−1.33	5.17
		(0.76)	(99.24)	TA	−0.14	0.68	−0.16	0.27
REV	640	112	528	NI	−6.11	2.70	−1.07	0.77
		(17.50)	(82.50)	TA	−0.36	0.25	−0.07	0.06
NOI	2116		2116	NI		26.70		2.00
			(100.00)	TA		0.39		0.11
NOE	2166	1	2165	NI	−76.82	7.70	−76.82	1.44
		(0.05)	(99.95)	TA	−0.51	0.35	−0.51	0.10
OTH	103	49	54	NI	−1.36	46.65	−0.29	1.13
		(47.57)	(52.43)	TA	−0.74	0.57	−0.10	0.10
BI	2199	473	1726	NI	−7.93	167.97	−1.93	19.16
		(21.51)	(78.49)	TA	−1.25	1.80	−0.28	1.16

INV=investment income; SUB=government subsidy; REV=asset revaluation gain and loss; NOI=nonoperating income; NOE=nonoperating expense; OTH=other below-the-line items; and BI=total below-the-line items.

Scaling variables: NI=income before taxes; and TA=total assets.

are substantially larger than negative items (e.g., 167.97% vs. 7.93% based on an income-deflated mean or 19.16% vs. 1.93% based on income-deflated median).

Table 2 contains descriptive statistics for all the variables used in this study and Table 3 reports correlations among earnings components. Panel A of Table 2 presents both individual and total below-the-line items using assets as a deflator. For asset revaluation (REV) and nonoperating expense (NOE), a positive number represents a loss or expense while a negative number represents a recovery or reversal of a loss or expense.⁸ Although we have already deleted extreme observations, descriptive statistics still show a wide variation in below-the-line items. On average, 1.14% of total below-the-line items (BI) over assets suggest a material effect of these items in China. Among the individual items, investment income (INV) is clearly the most important with a mean of 0.84% of total assets, while government subsidy (SUB) and nonoperating income (NOI) are the next two items contributing to the positive total. Panel B reports descriptive statistics for other variables used in this study, again after deleting extreme observations.

The correlations in Table 3 reveal several patterns of relationship among earnings components consistent with either information reflected in the descriptive statistics of Table 2 or anecdotal evidence discussed earlier. A strong correlation of .768 between BI and INV confirms the dominance of investment income in below-the-line items. Again, government subsidy and nonoperating income are two important positive components of below-the-line items, as reflected by their significantly positive correlations of .287 and .322 with BI. The negative correlations of REV or NOE with BI (–.204 and –.517,

⁸ There is only one negative observation for NOE, and deleting this observation does not change any of the empirical results presented in this study.

Table 2
Descriptive statistics

Variable	N	Mean	S.D.	Min	Median	Max
<i>(A) Below-the-line items variables</i>						
INV	2202	0.84	1.97	−25.17	0.28	19.33
SUB	2202	0.31	0.79	−12.61	0	7.20
REV	2202	0.04	0.55	−7.59	0	16.52
NOI	2202	0.37	1.00	0	0.10	27.95
NOE	2202	0.34	1.21	−0.51	0.10	37.79
OTH	2202	0	0.40	−10.12	0	12.63
BI	2202	1.14	2.87	−59.03	0.74	27.95
<i>(B) Other variables</i>						
Price	2202	10.44	4.44	1.88	9.72	31.69
Return	2202	22.01	46.53	−69.56	14.72	279.60
BV	2202	2.09	0.90	0.09	1.96	6.11
OI	2202	0.16	0.21	−1.37	0.17	1.49
NI	2202	0.20	0.24	−1.66	0.22	1.46

INV=investment income; SUB=government subsidy; REV=asset revaluation gain and loss; NOI=nonoperating income; NOE=nonoperating expense; OTH=other below-the-line items; and BI=total below-the-line items. All below-the-line items variables in Panel A are scaled by total assets.

Price=April 30th closing price; Return=buy-and-hold return; BV=book value of equity per share; OI=operating income per share; and NI=net income (before taxes) per share.

respectively) suggest the loss/expense nature of these items. Finally, the significantly positive correlation of .525 between BI and NI is consistent with below-the-line items being an important component of the bottom-line figure in China. However, the dominance of operating income is also evident as the correlation of .914 between OI and NI is substantially larger.

To analyze our first research question, how the perceived difference between operating income and below-the-line items is priced in the stock market, we use both a return and a price model. The two models address related but different value-relevance questions. The return model provides information about whether an accounting amount is promptly reflected in changes in value over the return period, while the price model indicates whether an accounting amount is value relevant with respect to its association with firm value (Barth, Beaver, & Landsman, 2001). Kothari and Zimmerman (1995) specifically suggest the use of both models to permit more definitive inferences, which has become a common practice in the literature (e.g., Barth & Clinch, 1998; Easton, Eddey, & Harris, 1993; Francis & Schipper, 1999). As shown below, our return and price models are the two most frequently used models in the value-relevance literature (e.g., Amir, Harris, & Venuti, 1993; Bao & Chow, 1999; Chen et al., 2001; Collins, Maydew & Weiss, 1997; Eason & Harris, 1991; Eccher & Healy, 2000; Haw et al., 1998; Lee & Cao, 2002). We disaggregate earnings in each model for the purpose of comparing the value relevance of operating income vs. below-the-line items. We first estimate the two models with a restriction that earnings-response coefficients (ERC) are the same for different below-the-line items, and then again without this restriction. ERCs for operating income and below-the-line items are compared to examine whether the stock market

Table 3
Correlations of earnings components

	BI	INV	SUB	REV	NOI	NOE	OTH	OI	NI
BI	1								
INV	0.768 (0.00)	1							
SUB	0.287 (0.00)	0.025 (0.22)	1						
REV	-0.204 (0.00)	0.031 (0.13)	0.002 (0.89)	1					
NOI	0.322 (0.00)	0.01 (0.63)	0.041 (0.05)	0.004 (0.81)	1				
NOE	-0.517 (0.00)	0.187 (0.00)	0.030 (0.14)	0.020 (0.33)	0.110 (0.00)	1			
OTH	0.154 (0.00)	0.001 (0.93)	0.008 (0.70)	(0.00) (0.97)	0.021 (0.30)	0.004 (0.84)	1		
OI	0.136 (0.00)	0.008 (0.68)	0.060 (0.00)	0.098 (0.00)	0.067 (0.00)	0.311 (0.00)	0.009 (0.66)	1	
NI	0.525 (0.00)	0.306 (0.00)	0.169 (0.00)	0.167 (0.00)	0.073 (0.00)	-0.479 (0.00)	0.055 (0.00)	0.914 (0.00)	1

BI=total below-the-line items; INV=investment income; SUB=government subsidy; REV=asset revaluation gain and loss; NOI=nonoperating income; NOE=nonoperating expense; OTH=other below-the-line items; OI=operating income, and NI=net income (before taxes). All variables are scaled by total assets. Numbers in parentheses are *p*-values.

prices them differently and whether the differential pricing is consistent with perceived difference in persistence.

$$\text{Return}_t = \alpha_0 + \alpha_1 \text{OI}_t - \alpha_2 \text{BI}_t + \varepsilon \quad (1)$$

$$\begin{aligned} \text{Return}_t = & \alpha_0 + \alpha_1 \text{OI}_t - \alpha_2 \text{INV}_t + \alpha_3 \text{SUB}_t - \alpha_4 \text{REV}_t + \alpha_5 \text{NOI}_t - \alpha_6 \text{NOE}_t \\ & + \alpha_7 \text{OTH}_t + \varepsilon \end{aligned} \quad (2)$$

$$\text{Price}_t = \beta_0 + \beta_1 \text{BV}_t + \beta_2 \text{OI}_t + \beta_3 \text{BI}_t + \varepsilon \quad (3)$$

$$\begin{aligned} \text{Price}_t = & \beta_0 + \beta_1 \text{BV}_t + \beta_2 \text{OI}_t - \beta_3 \text{INV}_t + \beta_4 \text{SUB}_t + \beta_5 \text{REV}_t + \beta_6 \text{NOI}_t \\ & - \beta_7 \text{NOE}_t + \beta_8 \text{OTH}_t + \varepsilon \end{aligned} \quad (4)$$

where Return_t is a 12-month buy and hold return ending on April 30th of year $t-1$ and Price_t is a closing price on April 30th of year $t-1$.⁹ The restricted models (Eqs. (1) and (3)) contain only operating income (OI) and total below-the-line items (BI), while the unrestricted models (Eqs. (2) and (4)) contain OI and six individual below-the-line items as defined in Table 1. All independent variables are on per-share basis, and those in the return model are further scaled by a closing price at the beginning of a return year.

To examine our second research question—whether the time-series properties of operating income and below-the-line items are consistent with a perceived difference in persistence—we employ both an autoregression and a one-year-ahead earnings-prediction model. The following autoregression model is estimated for the bottom-line earnings as well as for each of the earnings components, and a larger coefficient for a particular earnings item suggests a higher degree of persistence in this item.

$$X_t = \alpha_0 + \alpha_1 X_{t-1} + \varepsilon \quad (5)$$

where X is an earnings or earnings component figure scaled by total assets.

In addition, a prediction model with and without assuming coefficient equality among individual below-the-line items is estimated to examine whether earnings components have different predictive powers. Consistent results for the first two research questions provide supportive evidence that information about earnings persistence is properly impounded in stock prices. The prediction models with and without restriction on coefficient equality is as follows:

$$\text{NI}_{t+1} = \gamma_0 + \gamma_1 \text{OI}_t + \gamma_2 \text{BI}_t + \varepsilon \quad (6)$$

$$\begin{aligned} \text{NI}_{t+1} = & \gamma_0 + \gamma_1 \text{OI}_t + \gamma_2 \text{INV}_t + \gamma_3 \text{SUB}_t + \gamma_4 \text{REV}_t + \gamma_5 \text{NOI}_t + \gamma_6 \text{NOE}_t \\ & + \gamma_7 \text{OTH}_t + \varepsilon \end{aligned} \quad (7)$$

where NI_{t+1} is one-year-ahead net income before taxes and other variables are the same as defined earlier. All variables in models (6) and (7) are scaled by total assets.

⁹ April 30th is the official date by which each listed company has to issue its annual report in China.

Finally, we partition our sample based on earnings-management variables and observed persistence, and estimate models (Eqs. (1)–(7)) again on the partitioned subsamples. Earnings management presumably affects earnings persistence, and observed persistence allows us to identify companies with known transitory below-the-line items on an ex post basis. By introducing these two dimensions into the analysis, we are able to examine whether earnings management interferes with earnings persistence, how stock prices reflect this interaction, and whether the market properly discounts below-the-line items without persistence. This analysis will provide additional evidence on the robustness of the results based on the first two research questions.

5. Empirical results

5.1. Market pricing of operating income vs. below-the-line items

Table 4 presents valuation results based on return models in Panel A and Panel B on price models.¹⁰ All regressions are estimated for individual years as well as for pooled firm-year observations, with White-corrected *t*-statistics presented in the table. Overall, each and every model is highly significant with predicted signs for most of the independent variables. In particular, operating income (OI) and total below-the-line items (BI) are consistently significant with positive coefficients in all regressions. These results confirm the role of earnings information in stock valuations in China.

To compare pricing of operating income vs. below-the-line items, we examine the coefficients of OI and BI, first based on the restricted model. In Panel A, the coefficient of BI is larger than that of OI in each annual regression as well as in the pooled regression, and the difference is significant for all regressions except for 2000 according to the *F*-tests of coefficient equality. This suggests that the market places more weight on below-the-line items than operating income, which is contradictory to the perceived difference in persistence between the two earnings components. The results based on the unrestricted model provide a very similar picture with significant *F*-tests for all regressions, although details differ with respect to which below-the-line items have larger coefficients than operating income. Overall, the results of the unrestricted model seem driven by three positive items, i.e., investment income (INV), government subsidy (SUB), and non-operating income (NOI).¹¹

¹⁰ Although the return model in Panel A includes only earnings-level variables, we have also estimated the model with both the level of and change in earnings and earnings components. Since the conclusion remains the same, we present the results from the earnings-level model for the sake of parsimony.

¹¹ Different from expectation, in both panels of Table 4, the regression coefficients on REV and NOE are mostly positive. There are two possible explanations. First, as shown in Table 1, about 18% of the REV cases are income-increasing, representing recoveries of asset write-downs. Second, many of the asset write-downs are voluntary and an important NOE item in China is a restructuring charge, both of which may signal the potential for improvement in future performance. The market responds positively to information with a signaling value. A recent study by Chen, Chen, Su, and Wang (2004) provides evidence about asset write-downs in China that is consistent with this signaling explanation.

Table 4
Pricing of operating income vs. below-the-line items

	1997		1998		1999		2000		Pooled	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
(A) Return models (1): $\text{Return}_{it} = \alpha_0 + \alpha_1 \text{OI}_{it} + \alpha_2 \text{BI}_{it} + \varepsilon_{it}$; (2): $\text{Return}_{it} = \alpha_0 + \alpha_1 \text{OI}_{it} + \alpha_2 \text{SUB}_{it} + \alpha_3 \text{REV}_{it} + \alpha_4 \text{NOI}_{it} + \alpha_5 \text{NOE}_{it} + \alpha_6 \text{OTH}_{it} + \varepsilon_{it}$										
Intercept	-5.23 (0.02)	-11.90 (0.00)	-17.00 (0.00)	-22.80 (0.00)	54.64 (0.00)	52.85 (0.00)	16.46 (0.00)	9.81 (0.00)	13.36 (0.00)	6.55 (0.00)
OI	1.75 (0.03)	3.08 (0.00)	1.61 (0.00)	2.55 (0.00)	2.85 (0.00)	3.27 (0.00)	2.04 (0.00)	2.60 (0.00)	3.19 (0.00)	3.92 (0.00)
BI	4.79 (0.00)		3.59 (0.00)		8.01 (0.00)		3.52 (0.03)		4.87 (0.00)	
INV		6.36 (0.00)		3.55 (0.00)		11.82 (0.00)		8.71 (0.00)		7.74 (0.00)
SUB		5.72 (0.61)		3.96 (0.07)		5.84 (0.11)		6.78 (0.14)		6.97 (0.00)
REV		3.14 (0.06)		7.75 (0.02)		1.35 (0.67)		4.52 (0.61)		7.53 (0.00)
NOI		12.20 (0.03)		11.87 (0.00)		18.15 (0.00)		19.29 (0.00)		15.74 (0.00)
NOE		23.52 (0.00)		16.89 (0.02)		9.42 (0.10)		4.07 (0.00)		7.21 (0.00)
OTH		6.04 (0.00)		-65.15 (0.06)		160.20 (0.52)		13.50 (0.06)		6.52 (0.00)
N	392	392	532	532	610	610	668	668	2202	2202
Adj R ²	0.04		0.06	0.12	0.07	0.09	0.04	0.12	0.05	0.08
F-test ¹	5.30 (0.02)		4.92 (0.02)		7.61 (0.00)		1.75 (0.18)		3.41 (0.06)	
F-test ²		3.55 (0.00)		5.70 (0.00)		5.04 (0.00)		5.63 (0.00)		6.38 (0.00)

(B) Price models (3): $\text{Price}_t = \beta_0 + \beta_1 \text{BV}_t + \beta_2 \text{OI}_t + \beta_3 \text{BI}_t + \varepsilon_t$; (4): $\text{Price}_t = \beta_0 + \beta_1 \text{BV}_t + \beta_2 \text{OI}_t + \beta_3 \text{INV}_t + \beta_4 \text{SUB}_t + \beta_5 \text{REV}_t + \beta_6 \text{NOI}_t + \beta_7 \text{NOE}_t + \beta_8 \text{OTH}_t + \varepsilon_t$

	1997		1998		1999		2000		Pooled	
	(3)	(4)	(3)	(4)	(3)	(4)	(3)	(4)	(3)	(4)
Intercept	4.25 (0.00)	3.83 (0.00)	4.60 (0.00)	4.20 (0.00)	10.48 (0.00)	10.14 (0.00)	12.81 (0.00)	12.36 (0.00)	7.11 (0.00)	6.69 (0.00)
BV	1.43 (0.00)	1.19 (0.00)	0.83 (0.00)	0.72 (0.00)	-0.004 (0.98)	-0.02 (0.88)	0.10 (0.49)	0.09 (0.00)	1.30 (0.00)	1.17 (0.00)
OI	5.11 (0.00)	7.16 (0.00)	3.47 (0.00)	4.38 (0.00)	4.39 (0.00)	4.83 (0.00)	2.50 (0.00)	2.75 (0.00)	2.51 (0.00)	3.35 (0.00)
BI	5.27 (0.02)		3.12 (0.02)		10.99 (0.00)		6.35 (0.00)		3.95 (0.00)	
INV		8.87 (0.00)		3.76 (0.00)		11.86 (0.00)		6.99 (0.00)		7.14 (0.00)
SUB		4.23 (0.63)		4.17 (0.07)		6.77 (0.13)		8.18 (0.00)		3.85 (0.11)
REV		10.74 (0.00)		13.51 (0.03)		-5.76 (0.04)		2.15 (0.72)		0.16 (0.96)
NOI		13.01 (0.00)		10.10 (0.00)		21.95 (0.00)		28.95 (0.00)		16.13 (0.00)
NOE		39.61 (0.00)		34.58 (0.00)		8.40 (0.21)		-1.48 (0.53)		15.99 (0.00)
OTH		7.75 (0.00)		-138.43 (0.00)		238.84 (0.57)		-16.73 (0.33)		8.76 (0.04)
N	392	392	532	532	610	610	668	668	2202	2202
Adj R ²	0.34	0.45	0.28	0.40	0.11	0.13	0.08	0.12	0.13	0.17
F-test ¹	0.01 (0.92)		0.11 (0.73)		9.68 (0.00)		8.42 (0.00)		1.97 (0.16)	
F-test ²		7.02 (0.00)		11.93 (0.00)		4.19 (0.00)		6.57 (0.00)		12.29 (0.00)

BV=book value of equity; OI=operating income; BI=total below-the-line items; INV=investment income; SUB=government subsidy; REV=asset revaluation gain and loss; NOI=nonoperating income; NOE=nonoperating expense; and OTH=other below-the-line items. In Panel A, all independent variables are on per-share basis and further deflated by April 30th closing price. In Panel B, all independent variables are on per-share basis.

F-test¹ is a test of coefficient equality between OI and BI, while F-test² is a test of coefficient equality among all earnings components, i.e., OI, INV, SUB, REV, NOI, NOE, and OTH.

Numbers in parentheses are p-values.

The findings based on the restricted and the unrestricted price models shown in Panel B are overall consistent with the return-model results. The coefficients for below-the-line items tend to be larger than operating income. Although the results of the restricted models in Panel B are weaker than Panel A, as the *F*-tests show an insignificant difference between OI and BI for 1997, 1998, and the pooled regression, the unrestricted models provide strong evidence that some below-the-line items have significantly larger coefficients than operating income. In sum, both the return and the price model demonstrate that, rather than placing more weight on recurring operating income, the stock market in China seems to assess a premium on below-the-line items. This evidence certainly contradicts the perceived difference in persistence. If the observed time-series properties of these earnings components confirm the perceived difference, our results then point toward mispricing in the Chinese market.

5.2. Observed persistence and predictive power of operating income vs. special items

Table 5 presents the results of observed time-series properties of earnings components. Panel A presents data on whether observed persistence is consistent with perceived persistence for each component. The results clearly show that operating income is much more persistent than either total or any individual below-the-line items. The one-year-lag autoregressive model produces an R^2 of .38 and an autoregression coefficient of .64 for operating income, in comparison to an R^2 of .06 and a regression coefficient of .25 for the total amount of below-the-line items. Individually, government subsidiary (SUB) is the most persistent below-the-line item, with an R^2 of .15 and an autoregression coefficient of .37. Investment income (INV) and nonoperating income (NOI) rank as the second and the third in persistence.

The results from a one-year-ahead earnings prediction model in Panels B and C are overall consistent with the evidence of observed persistence in Panel A. When comparing the ability of operating income vs. total below-the-line items to predict next year net income, Panel B shows significantly larger regression coefficients for operating income than for below-the-line items in the annual as well as in the pooled regressions according to the *F*-tests of coefficient equality. In fact, the BI variable is insignificant in the 2000 and pooled regressions. The results in Panel C provide qualitatively similar evidence without the restriction of an equal coefficient for individual below-the-line items. While some below-the-line items are not significant in annual or pooled regressions, operating income is always significant and tends to have a larger coefficient for predicting future earnings.

Combining the market-valuation results in Table 4 and the time-series-properties evidence in Table 5, we seem to have two interesting findings. First, both operating income and below-the-line items are value relevant in the Chinese equity markets. Given that they both persist into the future to a certain degree, the results suggest a rational pricing mechanism in the market. Second, the time-series properties of operating income vs. below-the-line items are not fully reflected in stock prices. Although operating income is more persistent and has larger predictive power than below-the-line items, the market somehow places a higher premium on below-the-line items as reflected in their larger earnings-response coefficients. The next two sections present additional evidence to check the validity and robustness of our findings.

Table 5
Persistence and predictive power of operating income vs. below-the-line items

(A) $X_t = a_0 + a_1 X_{t-1} + \varepsilon$					
Earnings components	N	Autoregression coefficients	Adj. R^2		
OI	2202	0.64 (0.00)	0.38		
BI	2202	0.25 (0.00)	0.06		
INV	2202	0.33 (0.00)	0.12		
SUB	2202	0.37 (0.00)	0.15		
REV	2202	-0.13 (0.13)	0.01		
NOI	2202	0.23 (0.01)	0.10		
NOE	2202	0.23 (0.03)	0.02		
OTH	2202	0.02 (0.16)	0.01		

(B) $NI_{t-1} = \gamma_0 + \gamma_1 OI_t + \gamma_2 BI_t + \varepsilon$					
	1997	1998	1999	2000	Pooled
Intercept	0.01 (0.98)	0.77 (0.13)	0.10 (0.89)	0.39 (0.44)	0.64 (0.14)
OI	0.80 (0.00)	0.66 (0.00)	0.70 (0.00)	0.57 (0.00)	0.65 (0.00)
BI	0.41 (0.01)	0.43 (0.00)	0.42 (0.00)	-0.10 (0.56)	0.16 (0.27)
N	392	532	610	668	2202
Adj. R^2	0.36	0.34	0.28	0.18	0.27
F-test ¹	8.70 (0.00)	4.68 (0.03)	4.23 (0.04)	39.32 (0.00)	71.93 (0.00)

(C) $NI_{t-1} = \gamma_0 + \gamma_1 OI_t + \gamma_2 INV_t + \gamma_3 ONO_t + \gamma_4 REV_t + \gamma_5 NOI_t + \gamma_6 NOE_t + \gamma_7 OTH_t + \varepsilon$					
	1997	1998	1999	2000	Pooled
Intercept	-0.47 (0.54)	0.03 (0.95)	0.20 (0.80)	-0.01 (0.98)	0.001 (0.99)
OI	0.84 (0.00)	0.69 (0.00)	0.70 (0.00)	0.60 (0.00)	0.70 (0.00)
INV	0.57 (0.00)	0.53 (0.00)	0.51 (0.00)	0.03 (0.81)	0.32 (0.00)
SUB	-1.16 (0.28)	0.47 (0.10)	0.20 (0.37)	0.72 (0.13)	0.30 (0.13)
REV	-0.83 (0.00)	-0.01 (0.95)	0.07 (0.93)	0.04 (0.97)	-0.11 (0.76)
NOI	0.50 (0.08)	0.50 (0.06)	0.44 (0.08)	-0.94 (0.22)	0.38 (0.01)
NOE	1.53 (0.16)	1.45 (0.25)	-0.94 (0.28)	0.40 (0.24)	0.42 (0.27)
OTH	0.39 (0.25)	-12.78 (0.00)	8.76 (0.27)	1.71 (0.00)	0.34 (0.28)
N	392	532	610	668	2202
Adj. R^2	0.37	0.35	0.28	0.19	0.28
F-test ²	2.80 (0.01)	1.88 (0.08)	3.17 (0.00)	5.20 (0.00)	7.71 (0.00)

Panel A contains autoregressions, where X is an earnings-component variable, such as OI, BI, etc.

NI=net income (before taxes); OI=operating income BI=total below-the-line items; INV=investment income; SUB=government subsidy; REV=asset revaluation gain and loss; NOI=nonoperating income; NOE=nonoperating expense; and OTH=other below-the-line items. All variables are scaled by total assets.

F-test¹ is a test of coefficient equality between OI and BI, while F-test² is a test of coefficient equality among all earnings components, i.e., OI, INV, SUB, REV, NOI, NOE, and OTH.

Numbers in parentheses are p -values.

5.3. Additional evidence on the earnings-management sample

Anecdotal evidence suggests earnings management as an important reason for the large and frequently positive below-the-line items in China. Presumably, earnings management may change the inherent pattern of earnings persistence in a company, thus

creating one-time, transitory components within earnings. If pricing mechanisms properly reflect earnings' time-series properties, we expect to observe that below-the-line items resulting from earnings management are less persistent and the stock market places a discount on these items accordingly. Table 6 presents the results of such analysis based on three possible earnings-management samples.

First, we use a dummy variable, Right, to define a group of companies that may use below-the-line items to meet profitability targets for stock-rights offering as specified in the Chinese security regulations. As shown in Table 6, two small profitability ranges above the ROE targets of 10% and 6% are used in different years due to a 1998 change of the stock-rights regulation in China. Before 1998, the ROE target for the eligibility of stock rights offering was 10%, and during 1998, the Chinese authority lowered the ROE target to 6% for any individual year as long as the three-year average ROE is over 10%. Second, another dummy variable, DL, is used to identify companies that may manage earnings to avoid delisting. Since companies reporting negative ROEs for three consecutive years will be delisted in China, we classify a company to this group if below-the-line items are used to turn a loss into a profit. Several studies have employed this dummy-variable approach to identifying earnings-management samples

Table 6
Additional tests: earnings-management sample

	Model A	Model B	Model C
Intercept	4.90 (0.00)	6.65 (0.00)	-0.23 (0.62)
BV		1.19 (0.00)	
OI	5.30 (0.00)	4.71 (0.00)	0.73 (0.00)
BI	10.50 (0.00)	9.39 (0.00)	0.53 (0.00)
Right	-6.96 (0.16)	-1.79 (0.00)	0.62 (0.36)
DL	9.47 (0.04)	0.73 (0.21)	-4.59 (0.00)
BB	25.72 (0.00)	2.31 (0.00)	0.19 (0.89)
Right×BI	-6.37 (0.03)	0.95 (0.83)	0.04 (0.83)
DL×BI	-0.53 (0.85)	-0.32 (0.92)	0.54 (0.00)
BB×BI	-13.23 (0.00)	-13.45 (0.00)	-1.01 (0.00)
N	2202	2202	2202
Adj. R ²	0.08	0.16	0.31
F(BI+Right×BI)	1.14 (0.28)	5.67 (0.01)	4.55 (0.03)
F(BI+DL×BI)	25.77 (0.00)	12.26 (0.00)	50.62 (0.00)
F(BI+BB×BI)	1.76 (0.18)	2.64 (0.11)	26.36 (0.00)

Model A: $\text{Return}_i = \alpha_0 + \alpha_1 \text{OI}_i + \alpha_2 \text{BI}_i + \alpha_3 \text{Right}_i + \alpha_4 \text{DL}_i + \alpha_5 \text{BB}_i + \alpha_6 \text{right} \times \text{BI}_i + \alpha_7 \text{DL} \times \text{BI}_i + \alpha_8 \text{BB} \times \text{BI}_i + \varepsilon_i$.

Model B: $\text{Price}_i = \beta_0 + \beta_1 \text{BV}_i + \beta_2 \text{OI}_i + \beta_3 \text{BI}_i + \beta_4 \text{Right}_i + \beta_5 \text{DL}_i + \beta_6 \text{BB}_i + \beta_7 \text{right} \times \text{BI}_i + \beta_8 \text{DL} \times \text{BI}_i + \beta_9 \text{BB} \times \text{BI}_i + \varepsilon_i$.

Model C: $\text{NI}_{i+1} = \gamma_0 + \gamma_1 \text{OI}_i + \gamma_2 \text{BI}_i + \gamma_3 \text{Right}_i + \gamma_4 \text{DL}_i + \gamma_5 \text{BB}_i + \gamma_6 \text{right} \times \text{BI}_i + \gamma_7 \text{DL} \times \text{BI}_i + \gamma_8 \text{BB} \times \text{BI}_i + \varepsilon_i$.

Return=buy-and-hold return; Price=April 30th closing price; NI=net income (before taxes); BV=book value of equity; OI=operating income; and BI=below-the-line items. The independent variables are on per-share basis and further scaled by April 30th closing price in the return model, on per-share basis in the price model, and deflated by total assets in the earnings-prediction model.

Right is a dummy variable with a value of one if $10\% \leq \text{ROE} \leq 11\%$ in 1997, or $10\% \leq \text{ROE} \leq 11\%$ or $6\% \leq \text{ROE} \leq 7\%$ in 1998, or $6\% < \text{ROE} \leq 7\%$ after 1998. DL is a dummy variable with a value of one if $\text{OI} < 0$ and $\text{NI} > 0$. BB is a dummy variable with a value of one if both OI and NI < 0.

Numbers in parentheses are *p*-values.

based on the Chinese regulations regarding rights offering and delisting (e.g., Chen et al., 2001; Chen & Yuan, 2001; Lee & Cao, 2002). Finally, we identify a “big bath” sample as companies that report both negative operating income and negative below-the-line items.

We examine the impact of earnings management on pricing and time-series properties of operating income vs. below-the-line items by joining each of the three dummy variables with the total amount of below-the-line items in the return model (Model A), the price model (Model B), and the earnings-prediction model (Model C). If the pricing mechanism is efficient, we expect the dummy–BI interaction to be significantly negative, which means a smaller BI coefficient for the earnings-management subsample, and/or the F -test to be insignificant, which means an inconsequential BI variable in the regression for the earnings-management subsample.

Overall, this analysis leads to mixed results. For companies with earnings management to meet the ROE targets for rights offering, the return model produces a significantly negative interaction between Right and BI, suggesting that the earnings-response coefficient for BI is smaller for these companies. The F -test of $[(BI+Right \times BI)=0]$ further shows that the coefficient of BI is indeed insignificant for this subsample. This evidence is consistent with price impounding time-series properties in the sense that the market only values those below-the-line items that do not result from rights-offering-motivated earnings management. However, the price model does not provide corroborating evidence. The insignificant interaction term and the significant F -test indicate no difference in the valuation implication for BI between companies with or without earnings management motivated by rights offering. Similarly, the earnings prediction model is not able to detect any difference in the predictive power of BI between these two groups of companies.

When companies are classified based on the delisting variable, DL, none of the three models provides expected results as indicated by the insignificant interaction terms and the significant F -tests. The market does not seem to distinguish below-the-line items from companies with and without delisting motivated earnings management, and to the contrary, the power of below-the-line items in predicting future earnings is larger for the DL subsample as shown by the significantly positive interaction term in Model C.

However, for companies taking a “big bath” through below-the-line items, we obtain consistent and strong evidence that the pricing of below-the-line items properly reflects their time-series properties. The significantly negative interaction terms and the insignificant F -tests from both the return (Model A) and the price model (Model B) indicate that below-the-line items resulting from “big bath” type of earnings management do not have any valuation implications, which is consistent with the evidence of time-series properties from the earnings prediction model. As shown in Model C, the significant F -test $[(BI+BB \times BI)=0]$ together with the larger and significantly negative interaction term, $BB \times BI$, suggests a negative relation between below-the-line items and future earnings for this “big bath” subsample. This is consistent with the U.S. evidence reported by DeAngelo et al. (1992) and Burgstahler et al. (2002). Negative below-the-line items represent an interperiod transfer of expenses, i.e., the larger the “big bath” this period, the larger the earnings next period.

Table 7

Additional tests: nonpersistent sample

	α	N	F	Adj. R^2
(A) $Return_t = \alpha_0 + \alpha_1 OI_t + \alpha_2 BI_t + \varepsilon$				
Intercept	16.71 (0.00)			
OI	4.43 (0.00)	441	14.88 (0.00)	0.06
BI	6.85 (0.26)			
(B) $Price_t = \beta_0 + \beta_1 BV_t + \beta_2 OI_t + \beta_3 BI_t + \varepsilon$				
Intercept	8.72 (0.00)			
BV	0.48 (0.05)	441	11.38 (0.00)	0.07
OI	4.00 (0.00)			
BI	5.57 (0.42)			
(C) $NI_{t+1} = \gamma_0 + \gamma_1 OI_t + \gamma_2 BI_t + \varepsilon$				
Intercept	-1.48 (0.02)			
OI	0.90 (0.00)	441	104.14 (0.00)	0.32
BI	-4.49 (0.00)			

Return=buy-and-hold return; Price=April 30th closing price; NI=net income (before taxes); BV=book value of equity; OI=operating income; and BI=below-the-line items. The independent variables are on per-share basis and further scaled by April 30th closing price in the return model, on per-share basis in the price model, and deflated by total assets in the earnings-prediction model.

The nonpersistent sample contains only observations above the 90th percentile or below the 10th percentile of $\Delta BI = (BI_t - BI_{t-1})/|BI_t|$.

Numbers in parentheses are *p*-values.

5.4. Additional evidence on nonpersistence sample

Finally, we repeat our three-model analysis using a sample of firm/year observations that contain only nonpersistent below-the-line items identified on an ex post basis. An observation is included in this special sample if the change in below-the-line items during a two-year period is either above the 90th percentile or below the 10th percentile threshold computed as: $\Delta BI = (BI_t - BI_{t-1})/|BI_t|$. This sampling procedure results in 441 observations over the four-year period with below-the-line items that are extremely transitory in the sense that they completely reverse in the next period. Table 7 presents results from all three models.¹²

Both the return (Panel A) and price models (Panel B) provide consistent evidence that, while operating income is value relevant, transitory below-the-line items are not, as demonstrated by the highly significant OI but insignificant BI variable. Furthermore, Panel C confirms that operating income, persisting into the future, has an expected positive coefficient in predicting next-year earnings, but below-the-line items are negatively associated with future earnings because of their transitory, reverting nature. Consequently, this analysis based on the special sample strongly suggests that stock prices properly

¹² In addition to combining BI observations above the 90th percentile (BI decreases between the two years) with those below the 10th percentile (BI increases between the two years), we also analyze each group separately. The results are qualitatively similar.

impound the time-series properties of persistent operating income vs. transitory below-the-line items in China.

6. Conclusions

This study investigates the value relevance of operating income and below-the-line items in the Chinese stock market. Motivations for this study are twofold. First, there is a need for empirical evidence beyond the value relevance of aggregated accounting information in China. Although previous studies consistently find value relevance in China, the findings have been questioned and often are considered counterintuitive, given the low quality of the information environment. Examining the value relevance of earnings components with different levels of persistence allows us to provide additional evidence in this area. Second, the extant literature on earnings components is primarily based on examining special items in the United States. Studies using data from other countries are both limited and less focused in the international accounting literature. By comparison, the reporting environment for nonrecurring or less persistent earnings components in China is very different from the U.S. environment. Chinese GAAP is more specific in defining the scope and specifying the reporting format of these items. The Chinese income statement is clearly divided into two sections: recurring operating income and below-the-line items that are supposed to be less persistent. Furthermore, in sharp contrast to the special items being dominated by charges to the income statement in the United States, below-the-line items in China are overwhelmingly income-increasing and often account for a large percentage of a firm's reported net income. Anecdotal evidence suggests that using below-the-line items is a primary tool of earnings management in the Chinese stock market. These institutional features make China an interesting setting to examine how stock prices reflect earnings components with different levels of persistence.

We report empirical results in three areas. First, we find that both operating income and below-the-line items are value relevant, but price-earning multiples are significantly larger for below-the-line items than for operating income, which is contradictory to the perceived difference in persistence between these two types of earnings. Second, we demonstrate that the time-series properties of operating income vs. below-the-line items are both consistent with and different from the perceived difference. While operating income is more persistent and has significantly larger power in predicting future earnings than below-the-line items, we find that below-the-line items in China also persist into the future and are of predictive values. Combining the first two findings, we conclude that the pricing of operating income and below-the-line items in the Chinese stock market is rational to the degree that persistent earnings, no matter recurring or below-the-line items, are reflected in stock prices. However, the time-series properties of operating income and below-the-line items are not fully impounded in prices as evidenced by the unexpected relative magnitudes of earnings-response coefficients.

Finally, we provide additional evidence to explain and check the validity of the first two findings. We identify three subsamples of companies that are likely to manage earnings through below-the-line items and examine whether the pricing and time-series

properties of below-the-line items in these companies differ from other companies. Although the results are mixed, we provide some evidence consistent with the notion of stock prices properly reflecting time-series properties of below-the-line items. In particular, we find that below-the-line items resulting from a “big bath” do not have any valuation implications because they represent an interperiod transfer of expenses. Furthermore, we present strong evidence that transitory below-the-line items whose identity is based on observed persistence are not value relevant in China.

In sum, we present additional evidence of value relevance in China beyond aggregated earnings. An earnings component is impounded in stock prices as long as persistent and nonpersistent below-the-line items are value irrelevant. This result supports both the sophistication of the pricing mechanism and the quality of earnings information. As such, our findings cast a vote of confidence in the value relevance of accounting information in China. Given the evidence of this study, we believe that the findings of previous studies’ on value relevance are less likely to be statistical artifacts; rather, they represent an important role that accounting information plays in the Chinese stock market. Although the information environment in China is less than perfect, accounting information is so fundamental for equity investors that stock prices reflect not only aggregated earnings, but also earnings components. However, we also show that the time-series properties of earnings components are not fully priced in the market. The earnings-response coefficients are larger for below-the-line items than for operating income, although below-the-line items are less persistent and have a lower predictive power. While this is a pricing anomaly, our finding of a partial reflection of earnings time-series properties in stock price is consistent, in spirit, with the recent evidence by Burgstahler et al. (2002) based on the U.S. data. They find that stock prices do not fully impound time-series properties for either special items or recurring components of earnings.

Although we do not have direct evidence, we conjecture that Chinese investors place larger valuation weight on below-the-line items because of the unique institutional environment in which listed companies are somehow able to improve their bottom-line earnings through below-the-line items whenever such needs arise. The majority shareholders of listed companies are state-owned enterprises, and it is relatively easy and convenient for state-owned parent companies to arrange some favorable nonoperating transactions to help their listed companies boost earnings through below-the-line items. In addition, local governments often consider the number of listed companies in their jurisdictions as an important performance indicator and are motivated to help listed companies through various government subsidies when listed companies face financial difficulty. Future research can explore these issues, possibly using longer time-series data, to further enhance our understanding of the pricing of earnings components.

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Option-based compensation: a survey

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Abstract

Despite empirical research and theoretical validity, there is mixed evidence on whether employee stock options align interests between management and shareholders by turning managers into owners. What used to be a functional tool introduced in the 1950s, has gotten out of hand, as perceived by the press and popular literature. The main catalyst is the accounting treatment stock options receive. This paper provides an overview of the empirical research in the field and discusses the current accounting treatment of employee stock options and impending changes. We conclude by proposing alternative compensation tools.

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Keywords: Option-based compensation; Management; Shareholders

1. Introduction

The foundations for Employee Stock Option (“ESOs”) were laid by the United States Congress, and adopted by President Truman in 1950. On September 23, Truman signed the 1950 Revenue Act, which included a section that changed the prevailing tax code. The change made it legal for companies to pay employees with what we would now call stock

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options (Fortune, 2 July 2001). At first, ESOs uses increased primarily at the board of directors and management levels. Gradually, the use spread to the lower ranks, and today they are widely used in every industry.

As the use of ESOs increased, so too did the interest of academics. From the academic as well as the practical viewpoint, ESOs affect everything—from a company's compensation policy to its capital structure, and from accounting earnings to investment decisions. If implemented properly, ESOs can be used as a functional tool to streamline a company's compensation policy or capital structure. If implemented improperly, they can destroy shareholder value, overpay or demoralize employees, or even bankrupt the company. It is therefore crucial that management understands the mechanics of ESOs, as well as the benefits and downsides, before implementing an Employee Stock Option Program.

The mechanics of ESOs are similar to traded stock options when the major determinants of options (right to purchase shares, strike price, maturity date) are taken at face value. But there are some caveats: ESOs are inalienable, normally the options cannot be exercised until vested, and exercise of the options creates new shares. A key to understanding of ESOs, and their popularity, can be found in the applied accounting treatment, which is held in high regard by a majority of companies that use stock options, and is widely criticized by the popular and business press. Basically, the embedded and implied costs associated with ESOs are not recognized in the profit and loss statements, which essentially suggest that ESOs are free to the company. The perceived low costs have caused companies to issue large amounts of stock options instead of standard paychecks, which in some cases led to an over-issue of ESOs (Marconi plc is a prime example of this case (www.marconi.com), Marconi, 2003).

As the most widely used incentive-compensation tool, ESO has been widely researched from a variety of perspectives. While most prior research on the topic agrees that the use of ESOs has advantages, shifting academic and public opinion on this subject prevents full agreement on specific benefits. Although no one advantage emerges as the undisputed driver of ESO use, most agree that stock options provide (i) an alignment of the interests of management as decision makers and shareholders as risk bearers, (ii) incentives for managers to assume a responsible level of risk-taking, (iii) higher accounting profits, (iv) a non-cash payment currency for companies facing liquidity constraints, and (v) an opportunity to award managers when data noise makes it difficult to determine performances.

Despite empirical research and theoretical validity, there is mixed evidence on whether stock options provide a solution for the horizon problem, and whether tax advantages provide a driver for companies to use stock options. Furthermore, academic theory and business-literature releases suggest that stock options provide both an opportunity to issue shares at a premium and a tool to retain key personnel. However, there is no empirical research on either proposition. However, the use of stock options is by no means undisputed. Aside from the hype in the press and popular literature, academic literature shows that stock options cause (i) a deadweight loss to firms because employees value their options substantially below market value, (ii) opportunistic behaviour by management with respect to the timing of the stock-option awards, and most importantly (iii) dilution of share capital. There is also some mixed evidence and academic theory

suggesting that companies should discard stock options due to the loss of tax shield, an important driver of firm value according to business literature. Finally, there are practical and academic examples suggesting that stock options result in an agency cost inducing anti-takeover tool.

In the following sections, we will examine the accounting treatment of stock options. The remainder of the paper summarizes the empirical literature regarding the benefits and costs of ESOs, discusses the possible upcoming changes in accounting regulations, and provides an overview of the most important alternatives to ESOs.

2. Accounting for employee stock options

In 1972, the Accounting Principles Board issued Opinion No. 25: Accounting for Stock Issued to Employees ("APB 25") to replace Accounting Research Bulletin No. 43 (AICPA, 1953). APB 25 requires accounting for ESO compensation costs the intrinsic value² of the options on the measurement date, i.e. the first date both the number of shares under the stock-option plan and the strike price are known (Harter & Harikumar, 2002). The resulting costs are then, much like accrual-based accounting, spread over the period the employee is supposed to work to be entitled to the options. The result is clear: with the sole measurement date being the grant date and strike price at-the-money, no costs of ESOs is ever recorded. Interestingly enough, stock options with variable exercise prices³ or Stock Appreciation Rights ("SARs") were to be included as compensation expense in the income statement. The rationale for this inconsistency was the concern that stock options could not be reliably valued at the grant date.

This anomaly in the accounting regulations caused a surge in stock-option awards such that the Financial Accounting Standards Board ("FASB") acknowledged its heightened importance in 1984 by issuing an Invitation to Comment: Accounting for Compensation Plans Involving Certain Rights Granted to Employees. After receiving over 200 replies, the FASB unanimously agreed that employee stock options in fact resulted in a compensation expense. However, the scope of the replies turned out to be much wider than a focus on stock options only. Much like convertibles, stock options seem to float somewhere in the grey area between debt and equity. When a company issues stock options, it is in effect selling naked call options, i.e., the holder has the right to convert his/her options and receive newly issued shares. In other words, stock options are equity instruments or at least equity-like instruments. On the other hand, in practice, companies are reluctant to issue new shares and dilute their current shareholders. These companies can therefore either purchase shares or equity instruments in the open market, which locks in the cost of the stock-option program at the moment of the purchase of equity or equity instrument, turning the option program into a contingent liability. From the *Invitation to Comment*, the FASB picked up a multitude of similar distinction problems between equity

² The maximum of share price minus exercise price, or 0.

³ For instance, Indexed Stock Options, where the strike prices of the options are adjusted for by the performance of a benchmark index.

and liabilities. The FASB therefore shifted its focus to this broader question (Dechow Hutton & Sloan, 1996).

After the sudden surge in ESOs in the early 1990s and the accompanying attention it received in the press, the FASB was forced to react. After much debate and public attention, the FASB finally published its now notorious Exposure Draft in June 1993. In the Draft, the FASB proposed to require income-statement recognition of the “fair market value” of the ESOs. Strong opposition from the industry and even Congress forced the FASB to reconsider the proposed recognition. The fair market value of ESOs, as proposed by the FASB in 1993, states that ESOs should be treated as compensation just like salaries, bonuses, and pensions. The ESO cost calculation consists of two parts: the valuation of the options and the determination of the number of options. First, the FASB stipulates that companies can value their stock options using either a Black–Scholes-based formula or a binomial options-pricing model, where the company can estimate the time to maturity by assuming that employees will exercise their options when (i) the share price reaches a certain level, (ii) the underlying share reaches a certain volatility, and (iii) the share price has increased by a certain percentage over a given time frame.⁴ Second, the company can estimate the number of options that will eventually vest. The total ESO costs are simply the estimated option value multiplied by the expected number of vested options. This fair value is subsequently amortized and included in the income statement over the life of the option. Any subsequent changes in the option value are not accounted for, but any changes in the number of vested options⁵ are accounted for (Mozes, 1998).

Where there is an impact on the income statement, there is also an effect on the balance sheet: the accounting earnings are permanently reduced and therefore the retained-earnings account is reduced. This problem is nullified by the creation of the option account, an equity account, which in turn is closed to paid-in capital, resulting in the same reported total equity under APB 25 and the 1993 Exposure Draft (Dechow et al., 1996). Although the 1993 Exposure Draft was largely in line with public demand, and perhaps even common sense, the FASB received more than 1700 official comment letters, including 1000 form letters, mostly opposing the FASB’s proposals. The opponents included the (then) six major accounting firms, venture capitalists, the Securities and Exchange Commission (“SEC”) and even U.S. senators (Dechow et al., 1996). With this pressure from all angles, in 1995 the FASB finally adopted *Statement of Financial Accounting Standards* 123 (“SFAS 123”), a middle-of-the-road strategy, requiring disclosure of the before-described fair market value of ESO as costs in the form of a pro-forma income statement in the footnotes. Furthermore, it *recommends*, but does not *require*, recognition of ESOs in the income statement. Although SFAS 123 was introduced as a replacement for APB 25, and the FASB encouraged the adoption of SFAS 123, companies were free to

⁴ The freedom allowed by the FASB with regards to the “fair market value” is consistent with the abundance of academic literature on valuation and exercise of ESOs. With the specific attributes of ESOs and the holders’ irrational exercise behaviour, the Black Scholes formula seems insufficient to price ESOs, see for instance Lambert, Larcker and Verrecchia (1991), Hudart (1994), and Mozes (1998).

⁵ For instance, certain corporate actions such as takeovers or restructuring automatically trigger vesting of all outstanding stock options, or a larger than expected number of forfeited options decreases the number of vested options.

elect between SFAS 123 and APB 25.⁶ However, once a company chooses to adopt SFAS 123, it cannot revert back to APB 25. An overview of the differences and similarities between APB 25 intrinsic-value approach vis-à-vis SFAS 123 fair-value approach is presented in Table 1.

Where APB 25 is crystal-clear, SFAS 123 is considered rather vague, this is not solely due to the (widely viewed as insufficient) recommendation to recognize ESO costs. Rather, the FASB does not stipulate when to disclose the costs of the ESO, which could be the grant date, vesting date, or the exercise date. Additionally, the FASB allowed for interpretation of certain items by the companies, such as the above-described expected exercise date, which Mozes (1998) points out.

An accompanying problem with ESOs is dilution. The FASB requires companies to disclose dilution in their annual reports and present two different types of Earnings per Share ("EPS"), the normal EPS and the fully diluted EPS. The FASB has issued a Statement (SFAS No. 128, FASB, 1997) to calculate the dilution and diluted EPS according to the "treasury stock method":

$$\text{Dilution} = N_O * \max \left[0 - \frac{S - X}{S} \right]$$

$$\text{EPS}_{\text{Diluted}} = \frac{E}{N_S + N_O * \max \left[0 - \frac{S - X}{S} \right]}$$

where: N_S =number of outstanding shares, N_O =number of options, E =earnings, S =share price, X =strike price.

The last remaining aspect of stock options is taxes. Only when the stock option is exercised, is it absolutely certain that the holder of the option has been able to extract value from his/her options. And since the option holder's position is opposite that of the company, the holder's assured gain must mean the company's certain loss. Or so the FASB argues. The opportunity loss of the option for the company (i.e. the difference between the prevailing share price and the exercise price) is therefore made tax-deductible, even though the opportunity loss is not recognized in the income statement nor disclosed in footnotes. Not surprisingly, this particular feature of ESOs has caused a large part of the commotion in the press.

The accounting treatment of stock options is one of the main drivers behind the large-scale upswing in adopting stock options as a key part of corporate compensation policy. As can be derived easily from the above overview of accounting, the anomalous accounting treatment in itself causes higher reported profits and a tax-deduction for all "opportunity losses" upon exercise of the options. On the negative side, however, stock-option accounting also causes a loss of tax-deduction upon issuance of the options, and the reporting of lower, fully diluted EPS figures.

⁶ "[...] The fair-value-based method is preferable to the Opinion 25 method for purposes of justifying a change in accounting principle under APB Opinion No. 20, Accounting Changes. Entities electing to remain with the accounting in Opinion 25 must make pro forma disclosures of net income and, if presented, earnings per share, as if the fair-value-based method of accounting defined in this Statement had been applied" (SFAS 123, 1995).

Table 1
Overview of APB 25 and SFAS 123

	APB 25—Intrinsic value approach	SFAS 123—Fair-value approach
Costs	The compensation cost for stock option is measured as the excess of the quoted market price of the company's share over the strike price on the day shareholder approval is obtained	The compensation cost for stock option is measured as the fair value of the option; i.e., the value of the option as measured via an option-pricing model (Black–Scholes/Binomial) on the day shareholder approval is obtained
Disclosure	See Table 2	See Table 2
Fair value	Fair value of options granted and pro forma impacts need to be disclosed in footnotes	
Date of cost recognition	The compensation cost that corresponds to the intrinsic value amortized over the vesting period remains constant over time and reduces reserves No amortization or Profit and Loss impact following the vesting period	The compensation cost that corresponds to the fair value amortized over the expected life of the option remains constant over time and reduces reserves –No amortization or Profit and Loss impact following the vesting period
Equity account	Paid in capital increases by the same amount thus offsetting the reduction in reserves	Paid in capital increases by the same amount thus offsetting the reduction in reserves
Profit and Loss Statement impact	After the initial cost recognition, the only impact will be a Balance Sheet impact	After the initial cost recognition, the only impact will be a Balance Sheet impact
Balance Sheet impact	If the stock option is settled by the issue of new shares, shareholders' equity increases by the strike price of the option granted If the stock option is settled by the delivery of existing shares, the impact on equity will depend on the difference between the strike price of the stock option and the purchase price of the shares delivered to employees	If the stock option is settled by the issue of new shares, shareholders' equity increases by the strike price of the option granted If the stock option is settled by the delivery of existing shares, the impact on equity will depend on the difference between the strike price of the stock option and the purchase price of the shares delivered to employees

Source: Statement of Financial Accounting Standards No. 123 and Accounting Principles Board Opinion No. 25.

When keeping in mind the accounting treatment of stock options, (in particular that awarding stock options is not a recognized cost in the profit and loss statement and the tax deduction granted upon exercise), it would come as no surprise if these two reasons would actually be the most popular reasons for the heightened use of stock options. According to the companies' statements, however, the most quoted reasons for using ESOs are to motivate employees to create shareholder value and to align management objectives and shareholder objectives. Two recent examples are given by Eni S.p.A. ("Eni") and Telecom Italia Mobile S.p.A. ("TIM"), which introduced ESOs in 2000 and 1999, respectively. Eni stated that "In order to create an effective incentive tool, the Extraordinary Shareholders' Meeting of August 2, 2000, delegated to the board of directors the power to increase Eni's share capital up to a maximum of lire 30 billion (or about 0.375% of the current capital stock) through the issue of up to a maximum of 30 million ordinary shares. . ." (Eni S.p.A., 2000, 20-F, p. 78). A similar filing was posted by TIM: "During the course of the year, the Board of Directors executed the mandate conferred to it by the Shareholders' Meeting of December 1998 and implemented a stock-option plan. The transaction represents an effective means for the achievement of the pre-set objective of deeply involving management in reaching the Company's growth targets and in the shareholder value creation" (Telecom Italia Mobile S.p.A., 1999, Annual Report, pp. 7).

The reasons presented by companies to initiate or continue ESOs, or similar programs such as Share Appreciation Rights, Bonus Shares, etc., are all similar to the abovementioned reasons from Eni and TIM, namely to align interests. However, both the academic and popular press literature argues that there are more reasons than mere incentive alignment and the aforementioned favourable accounting treatment for companies to issue ESOs. A popular press view is presented strikingly by shareholder activist Nell Minow, when asked about the share-option packages awarded to Dell's CEO Michael Dell and Oracle's CEO Larry Ellison. Between 1996 and 1998, Mr. Dell received 38 million options, despite the fact that he, as the sole founder of Dell, already held 535 million shares. Mr. Ellison received 20 million share options, although he already held 700 million shares outright. Minow comments: "If they weren't already motivated enough to protect the owners' interests, then their shareholders are in worse trouble than they think" (Fortune, 2 July 2001). Although incentive alignment and accounting are indeed unmistakably features and drivers of ESO-utilization, they are not the only two reasons. Empirical research into the rationale for issuing ESOs indicates that there is other, perhaps more subtle, reasons. Some of the reasons mentioned below may not be actual drivers for management to adopt an ESO program; they are certainly beneficial side effects. Unfortunately, ESOs are a sort of Dr. Jekyll and Mr. Hyde story. The flipside of the ESOs is described below as well. Although some might argue that the costs outweigh the benefits for some companies, the widespread use of ESOs suggests that the professional world begs to differ.

The following section surveys the academic literature to determine whether these perceived advantages and disadvantages of stock options provide drivers or stumbling blocks for companies to issue shares. The accounting-driven benefits and costs of stock options are examined as well as other benefits and costs.

3. Benefits of employee stock options

3.1. *Alignment of interests*

The natural starting point for assumptions about managers is that managers are appointed by shareholders and that their main responsibilities are to protect shareholders' interests and increase shareholders' wealth. However, this notion neglects one important phenomenon: agency problems. Agency theory is based on the assumption that managers (as decision-takers) and shareholders (as risk-bearers) have ill-aligned objectives (Jensen & Meckling, 1976). Agency problems arise when shareholders have to bear the cost of manager's investments or actions that do not render sufficient returns. A well-documented example is RJR Nabisco's enormous fleet of corporate jets, which in the 1980s were used to fly the CEO's wife and dog around the world (Burrough & Helyar, 1990).

Agency problems are controllable, but controlling brings about monitoring costs—the so-called agency costs. Agency costs include (i) setting up and enforcing contracts, (ii) monitoring of management by shareholders, (iii) cost of rewarding optimal decision-making by managers and enforcing shareholder compensation for sub-optimal decisions, (iv) a residual loss which might arise due to too strict enforcement of the monitoring contracts (Weston, Chung, & Siu, 1990). Despite the costs associated with monitoring, Fama and Jensen (1983) argue that the separation of ownership and control encourages the separation of decision management and decision control, and thereby effectively argue in favor of the two-tier corporate-governance system characterized by a management board being supervised by shareholder-appointed board of directors. A non-executive director is usually a professional who works part-time for the company and full time for another, non-associated company. Weisbach's research (1988) supports this statement by concluding that firms with a higher percentage of outsiders, or non-executive directors, were more likely to fire their CEO, which for Weisbach is a clear indication that the monitoring role is functioning. However, the two-tier system as described is not beyond criticism: the system carries the distinct air of nepotism.

The two-tier system is scrutinized by Core, Holthausen, and Larcker (1999), whose findings include a higher CEO compensation when the CEO is also chairman of the board of directors, the board is larger, the board contains a larger percentage of outside directors, the directors are appointed by the CEO or when the directors are considered "grey" directors. Core et al. continue to summarize other literature that states that boards of directors are ineffective, such as Jensen (1993), Crystal (1991), Lambert, Larcker, and Wiegelt (1993), Boyd (1994) and Yermack (1997). With the two-tier system under such heavy scrutiny, the last line of shareholder defence is the ultimate agency-control mechanism: the hostile takeover (Manne, 1965). Takeovers, and especially hostile takeovers, can circumvent manager support or even approval by directly approaching the shareholders through a tender offer or proxy fight.⁷

As the old adage in healthcare goes, it is better to prevent than to heal. Fama (1980) therefore supports the proposal to tie managerial compensation to performance. He advocates that the stock market serves as an external monitoring device, which in turn

⁷ Interesting enough, ESOs can actually serve as an anti-takeover tool.

determines managerial compensation. Aside from compensation, it is widely assumed that ownership spurs results. However, the performance implications of executive incentives are not that obvious.⁸ Himmelberg et al. (1999) argue that if incentives are set endogenously and optimally, one does not expect to find a relation between the level of executive incentives and performance. Some firms use more incentives because they are trying to resolve more serious agency problems, but other firms use fewer incentives because their agency problems are less severe. As a result, neither type of firm performs better or worse in this setting, yet both types of firms would perform worse if they use either more or less incentives. They state that previous studies fail to control for unobserved firm heterogeneity that affects both ownership and performance and consequently the result of their studies are likely to show non-existing correlations (Zhou, 2001). Himmelberg et al. largely focus on stock ownership due to the lack of sufficient data on options. In light of Himmelberg et al.'s (interesting) findings, ESOs take on heightened importance. Fortunately, this is also the focus of the majority of the research.

Fama (1980) is only one in a string of academics and practitioners to argue that pay should be linked to performance, thereby turning the stock market into the ultimate external monitor. Jensen and Murphy (1990a, 1990b), however, conclude in their study into 1970s and 1980s compensation structures that pay is becoming increasingly insensitive to performance as a result of the decreasing percentage of ownership that management (and particularly the CEO) has in the company. Jensen and Murphy therefore hypothesize that increasing political forces in the public sector and inside organizations restrict a perfect relation between performance and reward. Their conclusion, is that CEOs are in fact increasingly paid as bureaucrats, something that confirmed the common notion in the popular and business press at the time. Despite the fact that the use of old data made the Jensen and Murphy study outdated upon publication, they set boundaries and limitations for the research, which future researchers were all too willing to embrace as a starting point for research into pay-performance sensitivities, mostly citing Jensen and Murphy as the "common academic view."⁹ For instance, Hall and Liebman (1998) claim to rectify this common view of low correlation between firm performance and CEO pay, by a direct link to Jensen and Murphy (1990a, 1990b). Specifically, they document that this relation is almost entirely created by increases in stock and stock-option values. According to their findings, the relation has increased since the 1980s (after the Jensen and Murphy study), largely due to the increase in the value of stock-option grants. At the same time, they also defuse Himmelberg et al.'s findings by stating that the major link between firm performance and pay is created by stock options, something Himmelberg et al. could not research due to insufficient data. It is, however, important to note that Hall and Liebman's research and Jensen and Murphy's research are conducted over different time frames, using different methodologies and different definitions of ESO compensation.

Zhou (2001) mentions that options are similar to shares only when the options are negligible compared to the shareholdings, or when the options are perfectly correlated with

⁸ We thank the referee for his comments on that issue.

⁹ An example is Hall and Liebman (1998) who not only start by stating: "A common view is that there is little correlation between firm performance and CEO pay", but actually name their article: "Are CEOs really paid like bureaucrats?", referring to Jensen and Murphy's (1990a, 1990b) chief findings.

the shares.¹⁰ Zhou, like many others such as Hudart (1994), Yermack (1995), Huddart and Lang (1996), Carpenter (1998), and Heath, Huddart, and Lang (1999), concludes that this is almost never the case and that stock options should always be viewed independently from share ownership in testing ownership–performance relation. Combining Zhou’s and Hall and Liebmann’s conclusions, Himmelberg et al.’s results seem to be of little interest for ESOs. Since managers of companies in highly regulated industries can exert less influence, the awarding of options as an incentive aligner is expected to be lower. Empirical studies on the subject provide evidence of this: Smith and Watts (1992) and Yermack (1995) find that in most, though not all, regulated industries companies award less ESOs, with the notable exception of the banking industry. The results of the two studies (and earlier work, according to Yermack (1995)) provide strong evidence that ESOs are indeed used to align interests and provide incentives for management to excel whenever possible (i.e., in non-regulated industries).

More evidence of incentive alignment is presented by Datta, Iskander-Datta, and Raman (2001), who investigate the relation between the market reaction to takeovers and merger announcements and equity-based compensation. Their study shows that, after controlling for exogenous variables, there is a significant and highly robust negative relation between the acquisition premium paid and equity-based compensation. The incentive-alignment argument is recognized by investors: Datta et al. also document a significant positive relation between abnormal share price performance around the takeover announcement date and equity-based compensation at the purchasing firm.

One of the few researches finding evidence against the common notion of incentive alignment is DeFusco, Zorn, and Johnson (1991) study. They make an interesting observation that contradicts agency theory—their study finds an increase in stock options is accompanied by a significant decline in research and development (“R&D”) expenditure, and an increase in selling, general and administrative expenses (“SG&AE”). A decrease in R&D would suggest an attempt to boost short-term earnings at the expense of long-term growth, whereas an increase in SG&AE would suggest decreased efficiency. DeFusco et al. refer to the limitations of their study, stating that they rule out a causal effect between stock options and the observed accounting data. Since incentive alignment is the key (communicated, at least) reason to issue ESOs, it has received the majority of attention in the academic press. Although there is no consensus on whether there is indeed a relation between stock options and share-price performance, the scale does seem to tilt towards the protagonists of ESOs and incentive alignment, like Smith and Watts (1992), Yermack (1995), Datta et al. (2001) and Core and Larcker (2002), among others. Of the researchers finding no relation between incentive alignment and ESOs and/or managerial ownership, Himmelberg, Hubbard, and Palia (1999) focus solely on shares, whereas DeFusco et al. (1991) rule out any causal relation in their findings that contradicts agency theory due to severe limitations in their study.

In summary, as Perry and Zenner (2001) conclude, Jensen and Murphy are not to be disregarded, but rather are to be used as a benchmark for comparing the 1970s and 1980s

¹⁰ What Zhou calls the correlation between the share-price movement and option-price movement is called the option’s delta. A low delta typically means that the option is far out-of-the-money; conversely a high delta means that the option is deep in-the-money.

with the 1990s. Although different studies use different research methods, sometimes making comparison difficult, the concluding observation is that CEOs are no longer paid as bureaucrats; the pressure of investors and policy makers seems to be paying off.

3.2. Mitigate risk-related incentive problems

The theory behind this benefit of stock options is that managers without equity-based compensation are oftentimes too focused on reporting short-term accounting profits, and in particular on short-term stability to increase their own job security. The rationale for this is that the manager's financial upside is capped, whereas his/her downside includes, amongst others, his or her job. Consequently, these managers sometimes pass up risky, yet profitable, investments in favour of stable, but less profitable investments. Stock options should mitigate this problem, since managers are forced to focus more on profitability to increase their own compensation package.

Conversely, the downside of the risk-related incentives of ESOs is that managers may be motivated to take excessive risks to increase the value of their ESOs. After all, managers can influence the value of their current stock option package by making riskier decisions, since riskier decisions are eventually translated into a higher stock-return volatility, which in turn increases the Black–Scholes value of the stock options. An example: Assume a company without any activities, worth \$100 per share. Consider two projects, where project A has a 50% chance of earning \$20 per share and a 50% chance of losing \$10. Project B has a 40% chance of earning \$40 per share and a 60% chance of losing \$60. Project A has an expected payoff of \$5, and project B an expected payoff of $-\$20$. A rational manager chooses project A. Now add at-the-money stock options to the equation. Suddenly the manager's payoff profile changes radically: project A has an expected payoff of \$10 per share and project B has an expected payoff of \$16. The increase in volatility, although ultimately negative for the company, has added 60% to the value of the stock options.

Although there is much anecdotal evidence, academic conjecture, and hefty speculation in the popular press, hard empirical evidence of increased managerial risk-taking directly resulting from ESOs is scarce.

Bizjak, Brickley, and Coles (1993) claim to be among the first to provide some empirical evidence that ESOs provide incentives for managers to adopt long-term views and invest in profitable, yet risky investments. They claim managers know that the market is sophisticated enough to recognize profitable projects and will reward the company in the long run, thereby incentivizing managers to invest rationally, instead of over- or under-investing to create short-term paper gains. Unfortunately, Bizjak et al.'s research is subject to flaws, according to Wruck (1993). Wruck comments that Bizjak et al.'s empirical tests do not focus on the relation between investment decisions and the structure of compensation contracts as the model suggests, but rather on the cross-sectional relation between the sensitivity of CEO pay to stock-price performance and various asymmetric information proxies. Instead, from Bizjak et al.'s study, Wruck concludes that companies with high information asymmetries (manager's vis-à-vis investors) adopt a compensation plan that concentrates on equity-based compensation.

Rajgopal and Shevlin (2002) mention numerous other studies that provide circumstantial evidence such as Jensen and Meckling (1976), Haugen and Senbet (1981), Smith

and Stulz (1985), Lambert (1986), Copeland and Weston (1988), Lambert, Larcker, and Verrecchia (1991), Hirshleifer and Suh (1992), Murphy (1999), Hemmer, Kim, and Verrecchia (1999), which all fail to provide empirical evidence. Rajgopal and Shevlin's own research *does* provide empirical evidence on the relation between ESOs and managerial risk taking by treating (oil and gas) exploration risk and ESO risk incentives as endogenous variables. Using the Sunder model (Sunder, 1976), their research into oil and gas producers shows that the coefficient of variations of future cash flows from exploration activity exhibits a positive association with the sensitivity of ESOs to stock-return volatility. Interestingly, the research shows that the ex-ante opportunity set, and not the ex-post exploration risk, determines the ESO risk-incentive setting. According to Rajgopal and Shevlin, this conclusion supports the earlier findings of Holthausen, Larcker, and Sloan (1995). The research also shows that ESO sensitivity to stock-return volatility is negatively related to hedging of oil and gas price exposure. In other words, managers with ESO exposure are more inclined to rely on the old finance fundamental that investors can hedge for themselves, if so desired, and forgo costly hedging activities.¹¹ In sum, the research finds that ESOs do indeed motivate managers to invest in high-risk, high-return projects. An important and obvious limitation of the study, however, is the lack of a broad cross-section of firms and industries.

Further evidence is presented by Datta et al. (2001) in their study of mergers and acquisitions. Since their study reports a significant positive relation between equity-based compensation and the growth potential of the acquired firm, they suggest that managers with a high equity-based compensation package are more inclined to engage in risky takeover projects. Their results are consistent with Smith and Stulz's (1985) argument that shareholders can reduce the risk that managers will pass up positive Net Present Value ("NPV"), yet risky projects, by increasing the convexity of the relation between manager's compensation and firm performance.

The perceived risk that managers are motivated to take excessive risks for personal gains as a result of ESOs is contradicted by the research of Carpenter (2000), who shows that for risk-averse managers, the preferred asset volatility converges to the Merton constant as asset value goes to infinity. Even more so, with the asset value at infinity, the manager's might actually reduce the volatility to reduce their own exposure to the volatility. In addition, giving managers more options also encourages them to reduce risk. One of the assumptions implied above still holds its ground though: options with a far out-of-the-money strike price *do* provide an incentive to increase risk.¹²

To summarize, both Datta et al. and Rajgopal and Shevlin present empirical evidence that stock options do indeed induce riskier decision making. In addition, Rajgopal and Shevlin describe prior empirical research that provides circumstantial evidence, which does not provide evidence to refute the academic theory. Moreover, Carpenter's research shows that ESOs do induce optimal decision making, but only to a certain extent; when the options are far in-the-money, the risky decision making is actually reduced, whereas far out-of-the-money options induce excessive risk taking. However, it would be unwise to

¹¹ Unlike finance theory sometimes leads us to believe, hedging is a costly activity. Since there is no perfect market, hedging entails bid/ask spreads, broker fees, potentially costly margin calls, etc.

¹² The repricing of ESOs after a bad share-price performance is partly explained by this (Carpenter, 2000).

apply Rajgopal and Shevlin's findings in the oil-and-gas exploration industry and Datta et al.'s mergers and acquisitions findings to the economy at large; before accepting the validity of this theory, further empirical results in a broader setting have to be presented.

3.3. Higher profits

Although considered unimportant in academic literature, reported earnings are held in high regard in the professional world. Because of the accounting-friendly treatment of ESOs, it is natural to assume that companies use ESOs as a large part of their compensation package to artificially inflate earnings. A less obvious phenomenon is that many companies have outstanding loan agreements, which include so-called debt covenants. Under a typical debt covenant, the interest rate of a loan increases if the borrower's financial position worsens, e.g., when the net income, EBIT or EBITDA drops below a certain threshold. By using non-recognized options as compensation, the company can avoid breaching the debt covenants. Matsunaga (1995) indeed finds that firms otherwise engaged in "window-dressing" (such as inventory accounting (LIFO/FIFO), depreciation schedules, amortization schedules, and the accounting for tax credit using flow-through methods) are more likely to use ESOs as a form of compensation. Furthermore, Matsunaga finds a negative relation between the extent to which a firm is below its target income level and the use of ESOs. The latter conclusion suffers from a notable limitation, namely that the implied relation is to some extent mechanical, resulting from an unmanaged income.

Consistent with Matsunaga (1995), Yermack (1995) uses interest coverage as a common proxy for large financial reporting costs, since firms with low interest coverage are more likely to adopt the non-recognized ESOs to reduce the risk of violating debt covenants. Whereas Matsunaga does find some evidence, Yermack does not find any significant results to support the hypothesis. The profit argumentation is of heightened importance for R&D-intensive industries, such as the oil and gas industry and the biotech industry. Aboody (1996) concludes from his research into recognition versus disclosure of R&D expenditure at oil and gas companies that recognition of a write-down causes a significant negative market reaction, whereas disclosure causes no significant reaction.¹³

In a comment letter to the FASB in response to the proposed mandatory recognition of ESO costs,¹⁴ the biotech industry claims that, as a result of compliance, reported earnings would be reduced, limiting its access to capital, which in turn would cripple R&D (Dechow et al., 1996). In research examining (i) share price reactions to events that increase the likelihood of mandatory expensing of ESOs, (ii) lobby against mandatory expensing of ESOs, and (iii) the likelihood that cash-starved companies are more inclined to compensate employees with ESOs, Dechow et al. investigate the merit in the biotech industry's and Aboody's argumentation. Their findings are surprising and contradict

¹³ Although Aboody's research is fundamentally unrelated to the ESO question, it does shed interesting light on the general Recognition versus Disclosure question to which ESOs are subject. Moreover, it is reasonable to assume that R&D disclosure/recognition will have an impact similar to ESO disclosure/recognition.

¹⁴ On 30 June 1993, the FASB issued an Exposure Draft, requiring the estimated value of ESOs to be recognized as an expense.

Matsunaga's (1995) and Aboody's (1996) results. Dechow et al. find no proof that mandatory expensing of ESOs would limit a firm's access to capital, and claim these findings are consistent with the popular view that the cost of capital argumentation is abused to disguise management's self-interested behaviour. Dechow et al. give a plausible explanation for their findings by claiming that the probability of the proposed mandatory expensing of ESOs always remained negligibly small, thereby limiting share-price fluctuations at announcements.

Espahbodi, Espahbodi, Razaee, and Tehranian (2002) take Dechow et al.'s research (1996) to the next level by focusing solely on the share-price impact of proposed changes in accounting regulations by issuance of Exposure Drafts. Although similar at first sight, the studies are actually quite different: Dechow et al. mainly focus on the lobbying against the Exposure Draft on stock options; Espahbodi et al. focus on actual FASB actions in the run-up to the issuance of SFAS 123 in 1995. Whereas Dechow et al. does not record a relation between higher reported profits and the use of ESOs, Espahbodi et al. do find a relation. They confirm that firms show significant negative and positive abnormal returns around the issuance of Exposure Drafts, proposing recognition of ESO costs and disclosure of ESO costs, respectively. Moreover, confirming the biotech industry's views, abnormal returns were most significant for high-tech, high-growth and start-up firms. There is also a positive relation between the share-price reaction and the tax-loss of carry-forwards, implying that a positive EPS impact is of even more importance when it is not cancelled out by the loss of a potential tax shield of ESO costs. The results show that, although investors are aware of the costs of ESOs due to disclosure, actual inclusion in bottom-line EPS does affect the company's equity value.

Except for the notable exception of Dechow et al.'s research into the biotech industry, the empirical findings show that the profit argument is an important benefit of ESOs: firms with low interest coverage increasingly issue stock options to improve the interest coverage; firms otherwise engaged in window-dressing increasingly award stock options; and proposed changes of regulations to recognize stock-option expenses depresses share prices. Moreover, Dechow et al.'s contradictory findings are at least partly explained by the fact that their research focuses on potential changes in accounting regulations that were never very likely to occur.

3.4. Liquidity constraints

ESOs cause no-cash outflow for the firm, and can even cause a cash inflow in the case of a good share-price performance. One would therefore expect that firms facing liquidity constraints would divert a larger part of the compensation package to ESOs. The currently available research defines liquidity constraints in a number of ways, for instance, as a low dividend yield or as a low payout ratio (which is essentially a derivative of the dividend yield). Using dividends as a proxy for the liquidity position is a disputed measure among researchers; most researchers present caveats warning that low dividends do not necessarily imply liquidity constraints. For instance, Miller and Modigliani (1961) state that investors (in a perfect market) should be indifferent towards firms' dividend policies, implying that a company's dividend policy is subject to numerous factors, of which the liquidity position is only one. In addition, some might argue that the dividend vs. stock-

option subject is a chicken-and-egg story: managers might lower or even abandon dividend payout to increase the value of their options. The ultimate indicator of liquidity constraints is bankruptcy; if a company is truly cash-starved; it cannot meet its financial obligations and will have to file for bankruptcy.

Gilson and Vetsuypens (1993) investigate just that, examining 77 companies that have filed for bankruptcy or privately restructured debt to avoid bankruptcy during 1981–1987, the era for hostile takeovers and corporate raiders. They find that 60% of the companies replace their CEO with an outsider in a given year around the bankruptcy event, and that new CEOs are on average paid 36% more than their predecessors. Although the higher wage for the new CEO might seem illogical, the newly appointed CEOs typically receive larger option grants as part of their compensation package.

Both Yermack (1995) and Smith and Watts (1992) investigate the liquidity argumentation from the dividend perspective. Yermack finds that the ratio of the stock option vs. cash component in the package almost doubles in firms paying no dividends. Smith and Watts, as part of their broad research, also find a negative relation between dividend yield and the use of ESOs.

Lambert, Lanen, and Larcker (1989) investigate the dividend hypothesis by using Miller and Modigliani's (1961) classic article as a starting point. Lambert et al. use this to link the increase in ESOs to the decrease in dividend level compared to the level that would have occurred in the absence of ESOs. To normalize the dividend level, Lambert et al. use a model devised by Marsh and Merton (1987). They find weak evidence that the most pronounced decrease in dividends occurs for firms where the increase in stock-option value is greatest. However, they are quick to point out the limitations to their study, namely that the study bypasses the major questions of why companies pay dividends and why companies award ESOs. These limitations are exactly the basis of Yermack's (1995) conclusion.

Using different data, DeFusco et al. (1991) conduct similar research, and reach a similar conclusion as Lambert et al. They find that the payout ratio increased, while the debt ratio decreased, which in turn appears to be driven by a decline in profitability that occurred in the 5-year period following adoption of the ESO plan. However, they take the same point of view as Lambert et al. (1989) in the sense that they expect the payout level to decrease since ESOs are not dividend protected. Even though Yermack (1995) admits that there is some merit in Lambert et al. and DeFusco et al.'s (1991) argumentations, he states that they fail to explain the magnitude of the shift of cash-based compensation to option-based compensation. A decrease in dividend yield from 3% to 0% increases the value of the ESOs by about 60%—too low to account for the observed near doubling of the ratio of options to cash compensation.

In conclusion, the liquidity constraint should provide a theoretically valid rationale for increased ESO use, but empirical evidence disputes this. The reason for this is that most researchers focus on dividends as a sign of liquidity constraints, such as Yermack (1995), Smith and Watts (1992), Lambert et al. (1989) and DeFusco et al. (1991). However, all the research that finds a negative correlation between dividends and stock options (as does all the before mentioned research) suffers from the limitation that dividend payment is increasingly affected by the internal causality that stock options might cause lower dividends, instead of the assumption that low cash flow might cause both low dividends

and stock options as a non-cash expense. Although Yermack's study suffers from the same limitation, he defends his findings by stating that the magnitude of the shift away from dividends is not solely explained by the existence of stock options, making the liquidity-constraint more compelling. Empirical evidence from the true liquidity constraint angle is provided by Gilson and Vetsuypens (1993), who find that bankrupted companies increasingly switch to stock options as a compensation method in the years surrounding the bankruptcy or restructuring event.

3.5. Risk reduction

Finance theory suggests that equity-linked compensation, and in particular highly leveraged compensation such as stock options, spurs managers on to take excessive risks. The rationale is simple: more risks in the business result in a higher volatility of the underlying share price, which, *ceteris paribus*, result in a higher value of the stock options.

3.6. Horizon problem

According to Yermack (1995), the "horizon problem" hypothesis predicts that CEOs nearing retirement will forgo valuable R&D and investment opportunities, as the operating results of profitable investments will not crystallize during the current CEO's reign, leaving all the profit for the successor. Since sophisticated investors can identify profitable investments and reward the company accordingly, the literature suggests that increasing the performance-based component of the compensation package could offset the horizon problem.

In his broad research, Yermack (1995) finds no increase in stock options as the CEO approaches retirement age. Yermack leaves open the possibility that companies gradually increase the stock-option component so that CEOs will have an extensive stock option package when they near retirement age, but some further investigations indicate no significant difference in vested options or stock for CEOs between the ages of 58 and 65. Yermack mentions that his results contradict Lewellen, Loderer, and Martin (1987) results, but fails to note a major limitation of Lewellen et al.'s study. Lewellen et al. use data for the period 1963 through 1973, which they identified as a shortcoming to their study, even in 1987. They claim an update of the data is virtually impossible to obtain given the changes in regulations by the SEC for the filing of 10-Ks and proxy filings. Yermack's results confirm Eaton and Rosen's (1983) earlier findings, who investigate the structures of various compensation packages for a number of variables. On the subject of age, they find that older executives, as they approach retirement age, typically receive a high level of delayed compensation in the form of pensions, but are less tolerant towards uncertainty about their compensation. Younger executives were more likely to receive compensation at risk in the form of stock options.

With a more recent sample than Lewellen et al., Dechow and Sloan (1991) also find that the horizon problem may be an incentive for companies to increase the performance-based part of the compensation package. First, they confirm the validity of the horizon problem by finding a significant decrease in R&D spending by CEOs nearing retirement. Second, they find that the decrease is mitigated through the CEO holding stock and stock

options. Dechow and Sloan do not necessarily contradict Yermack's results. As Yermack himself mentions, even though he finds no increase in ESO awards towards retirement, he cannot exclude the possibility that the executives have amassed enough outstanding ESOs from previous years to provide incentives to mitigate the horizon problem. The research published on stock options as a potential tool against the horizon problem is sparse and in some cases outdated. Lewellen et al. find that companies do indeed award stock options to circumvent the horizon problem, but their research focuses on 1963–1973, and it is therefore not surprising that subsequent researchers such as Yermack contradict their results. Overall, the sparsely available evidence is insufficient and contradictory; stock options might be a suitable solution to the horizon problem according to theory, but empirical research does not fully support the theory.

3.7. Noisiness of data

When accounting data contain substantial noise, monitoring management's performance and consequently awarding bonuses become increasingly difficult tasks for the board of directors. By relying on the fact that the effects of managerial decisions will crystallize in the future, it makes sense for the board of directors to base the compensation increasingly on future share-price performance, which will inevitably incorporate the quality of today's managerial decisions.

A first shot is made by Eaton and Rosen (1983), who define firms with fewer workers, low assets, less advertising expenditure, and a low variance of rate-of-return as firms with low monitoring costs and low noisiness of data. Their research finds a positive relation between the noisiness of the data and the use of stock options at the expense of salary, bonus, and pensions. By defining noisiness of accounting data as the time-series variance of changes in return-on-equity divided by the time-series variance of stockholders' returns (consistent with Lambert and Larcker, 1987), Yermack (1995) finds a positive relation between noisiness of the data and utilization of ESOs. However, the results are only significant at the 20% level. When eliminating industry dummy variables, the significance improves to the 9% level, but the findings still do not support Eaton and Rosen's (1983) and Lewellen et al.'s (1987) more significant findings (the before mentioned limitation to Lewellen et al.'s research regarding the outdated sample still applies). A possible explanation might be that Eaton and Rosen's and Lewellen et al.'s results are related to the use of ex post gains on ESOs as the dependent variable, since companies with the greatest variances of stock returns should also experience the greatest ex post increases in equity value, regardless of monitoring considerations (Yermack, 1995).

Sloan (1993) investigates the use of accounting earnings-based compensation versus stock price-based compensation for top management. He finds that earnings-based compensation is more frequently used in firms where (i) firm-specific stock returns have a higher association with market-wide movements in equity values, (ii) earnings have a higher association with firm-specific changes in value, and (iii) earnings have a less positive association with market-wide movement in equity values. From the second finding, we can conclude that stock-based compensation is used more often when earning changes do not automatically translate into stock-price changes, or in other words, when the accounting earnings contain a large amount of noise. As before with the horizon

problem, the available data is in some cases outdated. However, while using various definitions of noisiness of data, the available research is consistent in its conclusion that noisiness of data provides an incentive for companies to award stock options. The results and the conclusions drawn from the empirical research are consistent with the theory and expectations, and it is therefore plausible to assume that noisiness of data induces companies to award stock options.

3.8. Issue shares at a premium

Provided ESOs are struck out-of-the-money, they give the company an opportunity to issue shares at a premium vis-à-vis today's share price. Disregarding the above-mentioned benefits and the costs (noted below), ESOs once again show a similarity to warrants. If management deems its share price to be undervalued, it might decide not to issue shares at the current price, but instead issue warrants with a strike price above the current share price. According to some, it now has the best of both worlds: if the share price rises, the warrants will be exercised at a premium to current levels. Conversely, if the share price remains constant or even drops by a small margin, the warrant will not be exercised. Unless the company really needed the cash from a share offering, it still is in a fairly good position: it has not issued shares at what it deems a low share price, but it still received the premium paid by investors for the warrants. Additionally, for declining share prices, the company did not burden its new investors with losses on their shares, which could close the equity markets for issues in the future. The case for ESOs is identical, except that ESOs do not induce a cash inflow, but rather prevent a cash outflow in the form of compensation payment. When considering the fact that companies issue convertible bonds to benefit from low interest rates and the opportunity to issue shares at a premium in combination with the similarities between convertible bonds and stock options, the rationale for issuing convertibles and stock options must be similar as well, *ceteris paribus*. However, no empirical research is available to support the theory.

3.9. Key personnel

Due to the vesting period, ESOs can serve as a particularly useful tool to attract and retain key personnel. An employee with a large package of options will forgo the value of all his/her unvested options if he/she decided to leave the firm and is forced to exercise her vested options immediately, an irrational exercise since it is before maturity. And, the employee might expect to be compensated for the loss of his/her ESOs, making him/her expensive for any future employer.

Because this assumption seems so obvious, there has been little academic research into the subject, except some human-resource studies investigating at which price employees are willing to leave a current job for a new challenge. The merit of the argument has, however, been recognized by companies. Aegon, a well-known example of a company in financial trouble due to recent market turmoil, recognizes its decreased appeal by stating: "AEGON's ability to attract and retain key personnel, in particular senior officers, experienced portfolio managers, mutual fund managers and sales executives, is dependent

on a number of factors, including prevailing market conditions and compensation packages offered by companies competing for the same talent, which, may offer compensation packages that include considerable equity based incentives through stock option or similar programs” (2001 20-F, pp. 8).

3.10. *Tax advantage*

If ESOs are not recognized expenses, while cash wages are, how do ESOs create tax advantages?¹⁵ They do so in two ways: first, upon exercise of stock options companies can deduct the intrinsic value from taxes, as described before in the accounting section.

Second, top executives wages may not be fully tax-deductible in the United States since 1993, when public pressure forced the SEC to issue its Section 162(m) of the Internal Revenue Code (Section 162(m)). The spirit of Section 162(m) is best captured by the House Ways and Means Committee:

Recently, the amount of compensation received by corporate executives has been the subject of scrutiny and criticism. The committee believes that excessive compensation will be reduced if the deduction for compensation (other than performance-based compensation) paid to top executives of publicly held corporations is limited to \$1 million per year.” (1993 U.S. Code Congressional and Administrative News 877, taken from Perry & Zenner, 2001).

The advantage ESOs hold is therefore not that they become tax deductible, but rather that cash payments lose their tax deductibility above \$1 million, immediately decreasing bottom-line EPS with constant cash wage payments. This provides an extra incentive for companies to shift towards stock options.

Perry and Zenner (2001) investigate whether companies increasingly use ESOs in favor of cash payment after the introduction of Section 162(m) in 1993. They find that, although the regulations did not reach its prime stated objective of reducing compensation, the regulations do change the structure of the compensation contracts. Specifically, they find that firms with compensation packages of more than \$1 million increasingly shift towards performance-based compensation, with firms citing Section 162(m) as a key reason for the shift. The performance-based compensation increase is not solely at the benefit of stock options, but also bonus payments feature heavily. Empirical research on the subject is sparse, with only Perry and Zenner providing support for the theory. Since their research substantiates the theory, and a substantial number of companies cite Section 162(m) as a key reason to switch towards a performance-based compensation, we believe the theory holds merit.

¹⁵ Although this advantage of stock options is only relevant for U.S. corporations, it is included since it plays an essential part in compensation decision-making. Furthermore, the other quoted studies all focus solely on the United States, and this part is therefore required to present the full picture.

4. Costs of employee stock options

4.1. Deadweight loss

Since stock options are usually subject to restrictions such as a minimum holding period, inalienability, and barrier features, the option-receiving manager is forced to hold a substantial part of his/her portfolio in his/her employer's options. Moreover, the manager is usually not allowed to take risk-mitigating equity positions such as short call options or shares, or put options. Because of the manager's resulting inability to diversify, his/her position will be substantially below Markowitz's efficiency frontier (Markowitz, 1952). From this inefficiency, it follows that the manager's equity-based compensation renders too low an expected return to compensate for the concentration of risk. Consequently, the manager values his/her equity-based compensation below its market value. This difference between the manager's perceived valuation of the equity-based compensation and the actual market value is the deadweight loss to the firm. Since the company could have sold the equity-based instrument in the market to diversified investors and receive the full market value, it is effectively destroying value.

Meulbroek (2001) acknowledges the fact that firms face a tension between incentive alignment and portfolio diversification. The optimal trade off between costs and benefits differs from firm to firm, but in every case there is a "deadweight" loss. Meulbroek's research shows that this deadweight loss is the greatest for managers of high volatility firms (such as internet or technology firms) who hold a substantial part of their portfolio in the company's equity instruments. For instance, a completely undiversified manager of an Internet firm will value his/her stock options at only 53% of the market value, whereas a completely undiversified NYSE firm manager values her stock options at 70% of the market value.¹⁶ Since Meulbroek is the only researcher providing empirical evidence on the deadweight loss, we cannot automatically assume that her finding constitutes sufficient supporting evidence for the theory. However, given the validity of Markowitz's efficiency frontier, the intuitively sensible conclusion drawn from the portfolio and stock-option theory, and the robustness of Meulbroek's results, it is reasonable to consider Meulbroek's theory.

4.2. Dilution

As mentioned before, dilution makes ESOs quite similar to warrants in this respect. Since the seller of the option is the company itself, the instruments have a dilutive effect from the moment the employee decides to exercise his/her stock options. Companies can, and oftentimes do, hedge against this dilution. From the fact that the hedging activity itself is a costly exercise and that most companies still engage in hedging, it follows, *ceteris paribus*, that the dilutive effect is a costly side effect of ESOs.¹⁷

¹⁶ The above sheds an interesting light on insider share dealings: an undiversified Internet manager can truly believe and announce that her firm is undervalued (by less than 47%) and sell part of her shares to diversify and still benefit.

¹⁷ Assuming a perfect economy, the negative dilution effect of ESOs should be equal to the costs of neutralizing the effect.

SFAS 128 requires disclosure of dilution effect on the share capital and the corresponding EPS. As mentioned before, the popular press is quick to criticize most aspects of ESOs, and the disclosure requirements do not escape their wrath. For instance, the cover of the *Forbes* May 1998 issue read: "Stock Options Dilute Future Earnings," and the related article, which assumes that investors are largely unaware of the dilutive effect of ESOs, describes them as a mortgage on future earnings (Morgenson, 1998). Huson, Scott, and Weir (2001) investigate whether investors are indeed as oblivious towards dilution as Morgenson suggests. They explore the extent to which shareholders incorporate earnings into share price in the light of outstanding dilutive instruments, assuming that investors should place a lower value on unexpected earning changes for firms with many dilutive securities. Concurrent with their assumptions, Huson et al. find that expected dilution from currently outstanding instruments significantly weakens the relation between contemporaneous earnings changes and returns. Additionally, investors perceive dilution costs to be greater for firms with rising share prices—a correct assumption when studying the dilution formula issued by the FASB. Huson et al. conclude therefore that investors do in fact understand the dilution costs associated with ESOs and other dilutive instruments, contrary to what the popular and business press leads us to believe, but they stress that the current accounting regulations for dilution are still too conservative to fully capture the costs.

However, using proxies for both unexpected abnormal earnings and, particularly, expected dilution posts a major limitation on Huson et al.'s study. Using treasury shares held for conversion as a proxy for dilution assumes that companies use delta hedging to counteract the dilutive effect of stock options. Although a sensible theoretical assumption, since delta hedging is in fact the best way to hedge against dilution, it is practically flawed. Hardly any firms use delta hedging in practice; they use one of the following methods instead: (i) repurchase all shares under option, (ii) buy matching call options, (iii) enter into forward or future contracts, (iv) allow for dilution. With firms using any of the above methods, or a combination of them, Huson et al.'s assumption is fundamentally flawed in the sense that it either grossly over- or understates the real dilution costs. Furthermore, companies regularly keep shares in treasury even though the options they are supposed to hedge are so far out of the money that conversion is highly unlikely (with conversion probability denoted by the delta, so that Treasury Shares \gg Delta). Huson et al.'s defense is that since they cannot quantify dilution precisely, they do not presume to tell accountants how to account for dilution.

Core, Guay, and Kothari (2002) attack the treasury stock method and propose a new measurement. Using their proposed measurement, they find that the dilution is, on average, 100% greater than the treasury/stock method leads us to believe, and that, therefore, reported diluted EPS is overstated. They propose an alternative method of accounting for dilution, which, contrary to FASB diluted EPS, is consistent with the stated SFAS No. 128 (FASB, 1997). They argue that any diluted EPS measure should take into account the economic claims posed by option holders, something that SFAS No. 128 fails to do. Core et al. propose to define the diluted EPS with the following formula:

$$\text{Options} - \text{diluted EPS} = \frac{E}{N_S + N_O \frac{O}{P}},$$

where O =value per option.

The value per option, in turn, is defined by Core and Guay (2002) as an adaptation of Merton's (1973) dividend-adjusted version of the Black and Scholes model (1973).

Although the basic argument sounds solid, in the sense that option holders can convert and increase the equity of the firm, the combined equity value (i.e. the diluted share capital) is not simply the combined common stock and option value. Since Core et al. realize that ESOs are different from the plain vanilla options, they adjust for the early exercise of options by estimating the Black–Scholes value using two alternate times to maturity; 5 and 7 years. However, Core et al. forget to take into account two important features of ESOs compared to plain vanilla options. ESOs are non-alienable and employees are restricted to share trading in their own company's stock. This means that employees cannot sell their options, nor extract the embedded option value by derivative structures or delta hedging. As a direct consequence, ESO exercise becomes a binary event: either the employee exercises his/her option, or he/she does not in which case the option expires worthless. There has been plenty of academic research and debate on the topic of early exercise, Hemmer et al. (1999), Huddart and Lang (1996) to name but a few, but one thing remains evident: if and when the employee exercises her option, she pays the strike price, making the option value the difference between strike price and the prevailing share price, i.e. the intrinsic value.¹⁸ Although the options unmistakably have a theoretical value close to the Black–Scholes value, this value cannot be used to determine dilution. When applying Core et al.'s proposal, the dilution is indeed perfectly linked to the value of the option, but the option value will always remain a theoretical value. Due to the specific ESO features (most notably the inalienability and the trading restrictions), the employee has no means to extract the embedded value from the options. The value will therefore inevitably either erode slowly over time due to the option's θ or be lost to the employee in a split second due to early exercise.¹⁹

That dilution is a major negative aspect of stock options is acknowledged by companies, regulators, academics and (as Huson, et al.'s research suggests) investors. But despite being the sole, undisputed, identifiable drawback of stock options, companies, regulators, academics, and investors are all at a loss to quantify the magnitude of the costs. The FASB prescribed the treasury/stock method in SFAS 128, but the method is under scrutiny by all involved parties and is currently being investigated by the accounting ruling bodies. Core et al. propose an alternative to the treasury stock method, but their proposal looks flawed and appears to overstate dilution. Accounting changes, as will be described in the accounting section, seem inevitable and dilution reporting might well be one of the altered items.

4.3. *Anti-takeover*

Whereas ESOs are in fact meant to mitigate agency problems, they can actually create agency problems as well. When a company has a large number of ESOs struck just out-of-the-money, a takeover premium can lift the share price above the strike price. The exercise

¹⁸ This is of course assuming rational behaviour: employees do not exercise out-of-the-money options and always exercise in-the-money options on or before maturity.

¹⁹ The presented view on dilution echoes the rationale for an overall accounting proposal for ESOs, the Exercise-Date Accounting.

of the options will not necessarily cause a huge increase in the total takeover price, since the exercise price paid by the option holders will remain within the company. It can however create a poison pill. A prerequisite of course has to be that the employee cannot sell his/her shares to the potential acquirers (Couwenberg & Smid, 2001).

A well-known example arose in the banking industry, which saw a consolidation wave in the late 1990s and early 2000s. Although Deutsche Bank bought Bankers Trust, Chase Manhattan bought JPMorgan, Morgan Stanley bought Dean Witter, UBS bought Warburg Dillon Reed, and Allianz bought Dresdner Bank, no bank on the Street dared to touch Lehman Brothers. It was rumoured that despite their good reputation for especially high yields, Lehman Brothers was ignored due to the extensive option packages of management and high-ranking employees. Because the company largely resembles a partnership, potential buyers regarded management and high-ranking employees as “hostile” shareholders and snubbed Lehman as a takeover target. The available evidence on stock options as an anti-takeover mechanism is purely anecdotal, and the academic theory is sparse. There is, however, ample evidence that insider shareholding can serve as an anti-takeover mechanism—but, as shown earlier, shareholdings and options are only similar where these are either large or small deltas of the options. With relatively low equity values and historically very low interest rates, a new era of hostile takeovers and corporate raiders could emerge—empirical research into this subject could indeed soon prove to be relevant and provide interesting results.

4.4. *Tax reduction loss*

The flipside of the before mentioned higher accounting profits is the loss of tax-reduction. Although higher accounting profits should be considered irrelevant and meaningless from a shareholder-value perspective, tax reductions translate directly into a reduction in cash outflow and therefore create shareholder value. As advocated in most academic and popular literature, Cash is King (Stewart, 1999). However, we know from the same literature source that managers still attach high value to accounting earnings, and are eager to forgo tax shields in favour of higher reported accounting earnings.

Espahbodi et al. (2002) find some evidence that companies with tax-loss carry-forwards, consistent with the corporate-finance propositions, are more likely to award stock options. Since these companies cannot benefit immediately from the tax shield that cash compensation provides, the value loss of the foregone tax shield is minimal. Espahbodi et al. (2002) investigate the share-price impact of proposals to recognize stock options on companies with tax-loss carry-forwards, and find that the stock-price impact was positively related to the existence of tax-loss carry-forwards. Their results can be interpreted as follows: after implementation of compulsory recognition of ESO costs, companies with tax loss carry-forwards are more likely to issue ESOs, since these companies cannot benefit fully from the tax-loss carry-forwards. Espahbodi therefore concludes that the loss of tax reduction provides a barrier for firms to use ESOs, and conversely that when firms have tax-loss carry-forwards, the shift to ESOs does not sacrifice the tax shield, and thus becomes an incentive to issue ESOs.

A different empirical analysis is conducted by Yermack (1995), who approaches the tax reduction from the existing tax situation instead of investigating potential changes in

accounting regulations. He hypothesizes that firms with tax-loss carry-forwards are more likely to award options since they are likely to benefit least from the tax deductibility of cash compensation. His original research, including Stock Appreciation Rights (SAR), finds the expected, although insignificant, correlation. After taking into account Matsunaga's (1995) comments that the tax advantages of ESOs are lower when the options are awarded in the form of SARs, he readjusts the model to account for ESOs only omitting SARs. The results are that the coefficient found earlier moves even closer to zero, while remaining insignificant. That stock options cause foregone tax shields is not disputed—using stock options instead of cash payments causes higher reported profits, which in turn leads to a higher tax bill, *ceteris paribus*. Whether it affects corporate decision-making is disputed. As the abundant academic research and business press show, managers oftentimes do not follow the discounted cash-flow method and opt for higher reported earnings instead. The limited empirical evidence, which is also contradictory, does not allow one the possibility to draw a relevant and sensible conclusion on whether companies view the loss of the tax shield as a motive not to issue stock options.

4.5. Timing of ESO awards

Although the awarding of ESOs is not always the choice of management itself, it is widely accepted that management always has at least some influence in the awards. Management is therefore in the unique position to manipulate the timing of the awards. Since nearly all ESOs are struck as a function of the share price on the day of the award, it is beneficial for management to opportunistically award stock options just prior to issuance of positive news (Yermack, 1997). Alternatively, management can time the announcement of bad news to coincide with the scheduled issuance of stock options, thereby effectively lowering the strike price of their options.

Yermack's study focuses on the good timing of the unscheduled award of ESOs and finds that companies making unscheduled awards to their CEO outperform the market by more than 2% over a period of 50 trading days. Based on these results, Yermack argues that ESOs are awarded to align long-term interests of management and shareholders, but that the role of the managers in the process remains complex. He argues that the 2% out performance has little to do with managerial skills, efforts, or performance, but rather with the remarkably good timing of the awards just prior to the positive news. Yermack tested various hypotheses against his findings, but found none to contradict his results.

Yermack's finding is confirmed by Aboody and Kasznik (2000), who conduct their research from the opposite angle to Yermack's. Where Yermack focuses on the timing of unscheduled ESO awards just prior to good news, Aboody and Kasznik focus on opportunistic disclosure of bad news just prior to the scheduled award of ESOs, which results in the same thing: management receives stock options struck at a relatively low price. While they argue that executives manage shareholder expectations and advocate the timing of ESO to be changed to directly following earning announcements, they hasten to say that the management's activity does not necessarily affect shareholders' wealth. The board of directors might for instance allow the disclosure strategy as an implicit form of incentive compensation (Aboody & Kasznik, 2000).

4.6. Repricing of stock options

As shown before, management can influence its own compensation package, for instance by adjusting the composition of the remuneration package, adjusting the dividend policy, or by opportunistically timing the issuance of bad news or stock options. Repricing is perhaps the most obvious and direct method to manipulate the value of stock options. Repricing is the act of changing the strike price of the ESO (or cancelling the ESO and reissuing a new option) to a level that, according to proxy statements, “better reflects current market conditions.” Judging by HealthSouth’s proxy, a repricing typically occurs “when market conditions have, in view of the Board of Directors, artificially depressed the market price of the Common Stock for a protracted period, so that outstanding options are significantly out-of-the-money for reasons not related to the Company’s performance.”²⁰ (HealthSouth, 1994)

According to both theory and business, there are multiple reasons for companies to reprice stock options. One reason might be, as described by HealthSouth’s proxy, that the loss in option value might indeed have resulted from poor market or industry performance. In other words, the recent underperformance of the company was solely due to factors outside managerial control and therefore based on chance. The sheer argumentation defies logic. If we assume a normal distribution of chance, and therefore of under- or out performance, why would a company issue ESOs (which are solely based on share-price performance) as a form of performance-based compensation? When issuing ESOs, managers should realize they are subjected to the market’s mercy, for good or bad. Further arguments against the above-presented defense of repricing is given by the fact that, although chance can in fact work both ways, strike prices are rarely, if indeed ever, *raised* to reflect the artificially inflated share prices (Chance, Kumar, & Todd, 2000).

A second reason is presented by Chance et al. (2000), who state that companies reprice stock options to maintain managerial talent. As indicated before, a prime benefit of stock options is the retention of key managerial talent; however, when far out-of-the-money, stock options are worthless and therefore offer no incentive for the managers to stay at the firm. By repricing, the initial benefits and rationale of the stock options are restored and management in effect receives a second chance to set things straight.

A third reading by Gilson and Vetsuypens (1993) points to outside pressure. With stock options far out-of-the-money, management will become too entrenched and might consequently be induced to take excessive risks in a desperate attempt to create a payoff from the options. Excessive risk taking is always ultimately at the cost of the bondholders and creditors, and Gilson and Vetsuypens therefore argue that firms in financial distress might be persuaded by creditors to lower the strike price to dissuade managers from taking excessive risks.²¹

²⁰ An interesting detail: HealthSouth’s opportunistic management is from 20 March 2003 under investigation for fraud and overstating income statements.

²¹ That excessive risk taking is always detrimental for bondholders becomes immediately obvious when assessing the bondholder’s payoff profile, which resembles a short put option on the company’s assets. With, as explained before, increased risk taking increasing the volatility of the underlying share price, the short put option immediately increases in value, at the cost of the bondholder.

Feeding fuel to antagonist's fire, research finds (contrary to what the above proxy filing suggests) that the poor performance prior to repricing is not driven by market or industry factors. However, it is inconclusive evidence, since it also fails to show that management is to blame for the poor share-price performance (Chance et al., 2000). Chance et al. find that the impact of repricing is negligible for shareholders, but the gain is approximately 10% of the executive's total compensation. It is therefore understandable that repricing is not normally accompanied by abnormal returns either way. It is also more than understandable that repricing creates a media frenzy, comparable to Jensen's (1991) described perception of LBOs.

This is increased by the fact that the options would have been at the money in 19 months even without repricing. In addition, whereas the average share price decline is only 25%, the options are on average repriced by 40%. Recent research focuses on the lowering of the strike price, and ignores the possibility of increasing the value of options through changing controllable variables: increasing maturity of the option. ASML used this exact strategy and extended the maturity of four of its option programs by 4 years. The move increased the value of the options by 141 million Euros at the shareholders' expense (NRC Handelsblad website, 14 March 2003).²² Although the eventual impact on the option valuation is identical, the "Greeks" are impacted in a totally different way and therefore the provided incentives are different as well. With these different provided incentives, the "maturity repricing" merits its own field of research like the "strike repricing."

In conclusion, since resetting the strike price of ESOs is (if the share price is low enough) effectively nothing more than discarding worthless options and issuing new ones, the same rationale applies to repricing as to issuing options in the first place. This view is confirmed by research stating that repricing is most likely to occur within firms with substantial agency problems.

4.7. Dividend policy

As mentioned before under the advantages of ESOs, ESOs can mitigate the liquidity problems of a firm, where liquidity problems are defined as low dividend payments. However, as observed by the researchers (most notably DeFusco et al. 1991 and Lambert et al. 1989), this hypothesis suffers from the internal causality that ESOs can cause lower dividends since ESOs are not dividend protected. An opportunistic manager might therefore be inclined to lower the dividend payout compared to the expected dividend payout to protect the value of his/her options.

Prior research such as Lambert et al. and DeFusco et al. find a negative relation between ESOs and dividends, which are primarily explained by the liquidity-restraint hypothesis. However, Kahle (2002) partly explains the results by arguing instead that the lower dividends are caused by the ESOs and argues that the excessive cash is returned to shareholders via share repurchases. Her starting point is studied by Vermaelen (1981) and

²² To illustrate the mixed reactions to repricing, the corporate action prompted P. de Vries, the director of Vereniging van Effectenbezitters ("VEB", the Dutch shareholder rights watchdog), to say: "This is the same exorbitant self-enrichment (former prime minister Wim) Kok already mentioned six years ago" (NRC Handelsblad website, 14 March 2003).

Dann (1981) who both find abnormal returns of 3–4% at the announcement of a repurchase program. The two commonly accepted explanations of the abnormal returns are the signalling theory and the free cash-flow theory (Kahle, 2002). The two theories still apply, but the increase in repurchases since the early 1990s remained unexplained. Kahle, however, finds that companies are more likely to repurchase if the number of outstanding stock options is high compared to outstanding shares or when many options have recently been exercised.²³ Furthermore, her study shows that companies decide to distribute cash to the shareholders not by dividend payments but by share repurchases to protect the value of the executive stock options. From a corporate-finance standpoint, the repurchase has exactly the same result; from a practical standpoint the manager will destroy his/her option value by paying dividends, and enhance it by repurchase shares.

In what is essentially a combination of Yermack (1995) and Kahle (2002), Fenn and Liang (2001) reach the same conclusions as the two prior studies. By assuming that stock options can indeed mitigate agency problems as ample studies suggest, they presume that stock options affect corporate payout policy in one of two ways: (i) better incentive alignment can increase the total payout level to resolve the free cash-flow problem and attain a better leverage ratio (Mehran, 1992; Berger, Ofek, & Yermack, 1997) and (ii) stock options change the composition of the payout, specifically companies will favour repurchases over dividends (Kahle, 2002; Lambert et al., 1989). From their results, Fenn and Liang conclude that (i) firms increase total payout in the form of dividends and repurchases to control the agency costs of free cash flow, and that payout choice is influenced by factors such as firm characteristics, market valuation, permanence of cash-flow shocks, and management incentives such as stock options.

To conclude, the studies by Kahle (2002) and Fenn and Liang (2001) indicate that outstanding ESOs exhort managers to lower dividend payout in favour of share repurchases. From a corporate-finance standpoint, the result of a dividend payout and a share buyback is identical. Moreover, according to Miller and Modigliani (1961), investors should be indifferent towards the firms' dividend policies, implying that investors can imitate a dividend payout by selling part their shares. However, the reason that managers are forgoing dividends in favour of share buybacks is an opportunistic one. The result is that managers can influence their personal pay package without adding significant value to the company and its investors.

5. Current changes in the accounting regulations

As should be recognized by now, one of the main catalysts for stock options is the anomalous accounting treatment of stock options. Of course, the reasons and drivers for stock options are numerous as shown above, but the rationales are equally relevant for similar-incentive alignment tools or incentive-compensation packages. What truly sets the

²³ This is consistent with cross-sectional firm policies, as for instance at ING: "ING Group purchases, directly or indirectly, its own shares at the time options are granted in order to fulfil the obligations with regard to the existing stock-option plan and to hedge the position risk of the options concerned. The purpose of this policy is to avoid an increase in the number of shares, causing a dilution of the net profit per share" (2001 20-F, pp. 128).

stock option apart from its peers is the accounting treatment. To clear the way for other, and potentially superior, incentive-compensation packages and perhaps even more importantly, to breed confidence in the accounting community—sorely needed in the wake of the recent debacles—the accounting regulators decided to act. The understanding of the need for a hard-line stance to restore public confidence led to the release of Exposure Draft 2: *Share-based Payment* by the International Accounting Standards Board (“IASB”) in November 2002. The proposals may be modified in the light of the comments received before it is issued as an International Financial Reporting Standard (“IFRS”).²⁴

According to the IASB, “the objective of [draft] IFRS X *Share-based Payment* is to ensure that an entity recognizes all share-based payment transactions in its financial statements, measured at fair value, so as to provide high quality, transparent, and comparable information to users of financial statements” (IASB, 2002). In what looks similar in both substance and form to *Exposure Draft: Accounting for Stock-based Compensation* (FASB, 1993), “The [draft] IFRS requires an entity to recognize all share-based payment transactions in its financial statements, including transactions to be settled in cash, other assets, or equity instruments of the entity, and transactions with employees or other parties. There are no exceptions to the [draft] IFRS, other than for transactions to which more specific standards apply. For example, there is no exception for employee share-purchase plans” (IASB, 2002).

With respect to what exactly will be recognized in the income statement, the IFRS allows the company to use either side of the transaction, i.e. either the fair value of the services rendered by the employee or the fair-value of the compensation the company paid the employee for mentioned services. Since the IFRS assumes a fair payment for the services rendered, the two fair value assumptions should render identical values, and the IFRS therefore allows the company to use whichever fair value is more readily determinable. If the company chooses to determine the value of the awarded stock options, the same methodology as under SFAS 123 applies: the company can use either an option-pricing model, such as the Black–Scholes model, or a binomial model. As input for the model, the company uses:

- (i) The exercise price of the option
- (ii) The life of the option
- (iii) The current price of the underlying shares
- (iv) The expected volatility of the share price
- (v) The dividends expected on the shares
- (vi) The risk-free interest rate for the life of the option.

For non-transferable options, the option’s expected life rather than its contracted life shall be used in applying an option-pricing model. For transferable options, the option’s contracted life shall be used. If accepted before year-end 2003, companies will start to apply IFRS in its annual financial statements for periods beginning on or after 1 January 2004. The IASB encourages earlier adoption of the IFRS. Contrary to what happened in

²⁴ Since the exact name and number of the potential future Standard is as yet unknown, it will be referred to as [draft] IFRS X *Share-based Payment*, or simply [draft] IFRS.

1995, when the FASB recommended recognition of SFAS 123, a string of companies actually started to recognize ESOs in the income statement. The introduction lists JPMorgan, Amazon.com and Philips as more recent examples. For instance, in its second quarter 10Q 2002, Amazon.com mentions: "The Company announced that by the beginning of 2003 all stock-based awards granted thereafter will be expensed."

Reactions in the press resembled reactions to earlier announcements of expensing of ESOs, and mainly focused on the recent accounting scandals. "Amazon.com, the Internet retailer, yesterday broke ranks with other technology-related companies by announcing it would treat stock-option cost as expense from next year. [...] The treatment of stock options has come under fire since the Enron bankruptcy last year because critics believe excessive option grants have encouraged top U.S. executives to pump up their companies' share prices before selling stock" (Financial Times, 24 July 2002).

6. Alternatives to employee stock options

Stock options are the most widely used incentive tool in top- and middle management compensation. According to Rappaport (1999), they account for half of total top-management pay, and 30% of middle management pay. Despite their current negative aftertaste, academic literature suggests that options do in fact provide incentives for management to deliver a superior performance. However, the fact that stock options are the most widely used tool does not automatically mean that options are the *best* way to tie managerial pay to performance, as the prime goal of options is supposed to be. In fact, there are numerous alternatives to the plain vanilla stock options, which, at least in theory, provide a far better link between pay and performance. The reason these alternatives are hardly used lies in the anomalous accounting treatment of the plain vanilla options versus their alternatives—plain vanilla stock options are not recognized, whereas all the alternatives are. With the (at least presumed) importance of reported earnings, the plain vanilla stock option was the obvious choice. With the upcoming accounting changes perhaps close at hand and the recent negative press about plain vanilla options, the playing field should be levelled. It is therefore worthwhile to investigate some of the alternatives to plain vanilla options in more detail.

6.1. Indexed stock options

Indexed stock options exist in different forms, but they all share the main principle that the underlying share price outperforms a certain benchmark to determine or create a payoff. The most commonly used form of indexed stock options is where the option payoff is based on the out performance of the underlying share price over a certain index, or is zero when the underlying share price underperforms the index.

The logic for indexed stock options is obvious; the option only creates a payoff when the underlying share price outperforms a relevant benchmark, ensuring that only superior performance will be rewarded. Among the many criticisms stock options received recently (aside from the sheer magnitude of some of the grants), one of the main one's was that stock options rewarded sub-par performances. The 1990s saw booming share prices for

virtually every company, even the ones in dire straits. Individual share prices rose on the back of rising equity markets in general, creating an undeserved payoff of stock options. By indexing, the rise in the underlying share price is adjusted for by the rise in the index. For instance, if the underlying share price rises 25% and the relevant benchmark rises 20%, the payoff is 5%.

BASF uses indexed stock options as part of its compensation strategy and describes them as follows in its 2001 20-F: "...The second subscription right permits participants to purchase one BASF Share at a discount, provided that the performance of BASF Shares exceeds the performance of a benchmark index. For options granted in 1999 and 2000, the benchmark index is the DOW Jones EURO STOXXSM Total Return Index (the EURO STOXX) and for options granted in 2001 the benchmark index is the Dow Jones Global Chemicals Total Return Index (the DJ Chemicals). The discount is equal to twice the percentage by which BASF Shares have outperformed the benchmark index since the date of issue of the relevant right." The use of indexed stock options is advocated by Johnson and Tian (2000a,2000b), who state that indexed stock options filter out the effects over which management can exert no influence, resulting in a more effective incentive-compensation package. Johnson and Tian hasten to state that, although indexed stock options have a superior incentive alignment and a high sensitivity to changes in the share price, they also exert an extremely high sensitivity towards changes in volatility. Indexed stock options might therefore lead to non-prudent levels of risk taking, as is argued by Guay (1999) as well. As documented by Johnson and Tian (2000a,2000b), Guay (1999) finds that firms with a greater investment-opportunity-set structure their executive compensation package to increase convexity in order to stimulate risk taking.

Rappaport (1999) points out a limitation to indexed stock options, namely that indexed stock options have lower value than plain vanilla stock options due to their comparative nature—the holder is in fact long the underlying share and short the index.²⁵ Rappaport therefore advocates either lowering the strike price or awarding more options. Awarding more options has the drawback of increased dilution, whereas a lower strike price might reward a sub-par performance and the option's delta is still lower than plain vanilla options.

6.2. Knock-in barrier

Knock-in barrier options are awarded with an out-of-the-money barrier level and will only vest once the barrier level is breached. Notwithstanding the fact that the barrier level is out-of-the-money, the strike price can be set at any desired level.

Enel uses knock-in barrier options and describes its option program in its 2001 20-F: "Options vest if the average reference price of our shares on Telematico over the last three months of the year of the grant is higher than a target price determined by the board of directors at the time of the grant. The board sets the Target Price with reference to securities analysts' estimates of the future price of our shares. If the Target Price is not met

²⁵ For more elaborate pricing methods of indexed stock options, refer to Johnson and Tian (2000a,2000b).

in a given year, all of the One Year Options and 30 percent of the Three Year Options granted in that year do not vest and expire.”

6.3. *Step-up options*

An alternative to regular stock options is the so-called step-up options, where the strike price of the options is increased every year by a fixed amount or percentage. The rationale for step-up options is that they circumvent the common complaint for “standard” options that their payoff is high because on average equities rise. With the annual increase in strike price, the share price needs to outperform the historic annual increase in share price in order to payoff.

An example of step-up options is given in Volkswagen’s 2001 Annual Report: “The basis for the initial conversion price of the third tranche is the average price of the Volkswagen ordinary share on the Frankfurt Stock Exchange on the five trading days prior to the resolution of the Board of Management of VOLKSWAGEN on March 6, 2001, concerning the issue of convertible bonds. It will increase in each of the following years by five percentage points, so that the first purchase of ordinary shares will be possible at a price of 65.37 from July 14, 2003, after the minimum waiting period.”²⁶

6.4. *Accounting earnings*

Under an accounting earnings compensation plan, the top-management compensation is directly linked to the accounting earnings the company reports. As with plain vanilla stock options, and other performance-based compensation plans, the stated objective is to align incentive between top management and shareholders. The popularity of accounting earnings is, according to Sloan (1993), explained by the fact that accounting numbers are under management’s influence, contrary to stock options, which depend on the uncontrollable noise in equity markets to determine its value. The “controllability” of the accounting numbers is, given the current environment of accounting scandals, also cited as the main drawback to accounting earnings. Watts and Zimmerman (1986) focus on the increased incentive for opportunistic behaviour provided by accounting-based compensation.

Sloan (1993) finds that accounting-based compensation helps shield executives’ pay from market-wide fluctuations and that accounting-based compensation tracks firm-specific performance better than plain vanilla stock options. Sloan’s findings imply that CEO salary and bonus are more sensitive to earnings when (i) stock returns have a higher correlation with market-wide movements in equity values, (ii) earnings have a higher association with market-wide movements in equity values, and (iii) earnings have a less positive association with the market-wide equity values.

²⁶ For reasons of German law applicable at the time, the options granted under this plan took the form of conversion rights attached to convertible bonds rather than “standard options.”

6.5. SVA bonus

Plain vanilla stock options are considered by boards of directors and shareholders to successfully align incentives for both CEOs and unit-managers (Rappaport, 1999). The alternatives mentioned in this section prove to be even better at aligning incentives. However, almost all alternatives suffer from the same restriction: the eventual payoff of the instruments are based on share price, and, therefore, total firm performance. Since individual business units are essentially private companies falling under one corporate umbrella, inconsistent pay-for-performance links are the logical consequence.

A superior method for unit managers would therefore be to tie compensation to the performance of the specific business unit. According to Rappaport (1999), earnings, return-on-invested-capital (“ROIC”) and return-on-equity (“ROE”) are often used. However, all of them have critical shortcomings.²⁷ Rappaport (1999), therefore, advocates the superior shareholder-value-added approach (“SVA”), which measures the incremental value of the business unit’s operations over its invested capital. The SVA attaches a value to the change in future cash flows of the business unit, and applies standard discounted cash-flow techniques to determine the value of those cash flows. The next step is to compare the expected future cash flows from operations with the current and anticipated investments. The advantages are well documented: the approach uses cash flows instead of the manipulable accounting numbers; the business unit’s SVA should in fact translate immediately into the overall share price and, therefore, the shareholder’s value; and the SVA approach takes all the important value drivers (cost of capital, return on invested capital, capital structure, growth, sheer size of invested capital (Stewart, 1999)) into account.

Ittner and Larcker (2001) evaluate the abundantly available literature on economic-value-added (“EVA”) and its relation with market measures such as market value and shareholder return.²⁸ From Anctil (1996), Rogerson (1997), and Riechelstein (1997), Ittner and Larcker conclude that the use of residual income measures, such as EVA, as a compensation determinant can ensure goal congruence between shareholders and managers. However, according to Ittner and Larcker (2001), the literature is inconclusive as to whether divisional EVA provides a good proxy for share-price performance. Zimmerman (1997) argues that divisional EVA measures can be highly misleading indicators of value creation and may provide wrong incentives, even though corporate EVA tracks changes in the share price. The stock market seems to disagree with Zimmerman: Wallace (1997) finds some weak evidence that the stock market responds positively to the adoption of residual income-based compensation plans. Moreover, the long-term effects are clear: residual income-based firms decrease new investments, increase payouts to shareholders, and utilize assets more intensively, leading to greater residual income (Wallace, 1997). However, Hogan and Lewis’ (1999) results disregard

²⁷ The measures all have their distinct drawbacks: for more detailed information we refer to Brealy and Meyers, *Principles of Corporate Finance*; Copeland, Koller and Murrin, *Valuation*, and Stewart III, *The Quest for Value*.

²⁸ EVA is the more common term for what Rappaport calls SVA. EVA[®] was introduced by J.M. Stern and G.B. Stewart III and is a registered trademark of Stern Stewart.

Wallace's (1997) results, prompting Ittner and Larcker (2001) to point out the limitations applicable to all residual income-based studies: the information compensation is based on, namely the management-accounting data, differs significantly from the data researchers use, namely the publicly available financial-accounting data. Changes to every individual statement are required to make the data consistent—an error-prone activity.

6.6. Exotics

The alternatives described above can be combined in any desired way to create particular incentive alignments for particular situations. The alternatives are endless, and Enel S.p.A.'s (2001) 20-F provides an example of a combination of plain vanilla stock options and accounting earnings: "Options vest if both the earning before interest, taxes, depreciation and amortization, or EBITDA, of the Group for the fiscal year 2002 exceeds the estimated EBITDA as indicated in the budget approved by the board of directors and the price of our shares on Telematico outperforms a specified reference index over the same period. If any of these conditions is not met, all the options expire."

6.7. Share appreciation rights

An earlier-mentioned alternative to stock options is the Share-appreciation-right ("SAR"), which is in essence a cash-settled stock option. Deutsche Bank uses SARs as part of its extensive compensation package and describes the program as follows in its 2001 20-F: "The Group has share appreciation rights plans ("SARs") which provide eligible employees of the Group the right to receive cash equal to the appreciation of the Group's shares over an established strike price." Deutsche Bank's 20-F also highlights the main difference between stock options and SARs (aside from settlement): "Compensation expense on SARs, calculated as the excess of the current market price of the Group's common shares over the strike price, is recorded using variable-plan accounting. The expense related to a portion of the awards is recognized in the performance year if it relates to annual bonuses earned as part of compensation, while remaining awards are expensed over the vesting periods."

7. Concluding remarks

Current events seem to point in the direction of big changes in accounting regulations, but so did events in 1993, when the FASB issued its Exposure Draft. Eventually, 1993's Exposure Draft led to the largely inadequate SFAS 123. Will November 2002's Exposure Draft 2 suffer the same fate? Time will tell. The final date for comments was 7 March 2002, and maybe this time around the regulators will win. The environment does seem ripe. The once unified front is showing cracks, with some of the big guns such as JPMorgan, Coca Cola, Amazon.com, and Philips leading the way in recognizing stock options. But the regulators should not declare victory prematurely: Colvin (2002), for instance, believes that the good side will lose "the good fight" yet again. The research surveyed in literature review has been conducted over different timeframes, use various

methodologies, focus on many areas, and are set against various backgrounds. Consequently, the findings are often contradictory, but each has its intrinsic merits. We have noted the advantages and disadvantages of the different research results. The academic world tends to agree that stock options improve the performance of a company, provided that the stock-option plans are set in the right manner. The widespread use of stock options indicates that the professional world also believes the advantages outweigh the disadvantages. However, in the near future, with the probable disappearance of the anomalous accounting treatment of stock options, we might see the curtailment of stock options in favour of some of the alternatives. The alternatives we described in this survey are the most important competitors to the plain vanilla stock options, but the list is by no means exhaustive. On the contrary, the imminent accounting changes are bound to trigger a revolution in compensation policies. The extraordinary combination of the loss of non-recognition of stock options, the collapsing equity markets, the escalating accounting scandals, and the accompanying negative aura of stock options will provide an extremely fertile ground for innovative and we hope, effective compensation plans.

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A comparison of value relevance of accounting information in different segments of the Chinese stock market

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Abstract

This paper investigates the difference in the value relevance between the accounting information prepared and audited under the Chinese GAAP for A-share investors and under the international accounting standards (IAS) for B-share investors in the Chinese stock market. The study reports three primary findings. First, accounting information influences the pricing process in both the A-share market and the B-share market. Second, the accounting information in the B-share market is more value relevant than that in the A-share market, as expected. Finally, the value relevance level of accounting information in the A-share market was low in earlier years, peaked in 1996, and then decreased due to changes in the disclosure environment. However, the value-relevance level of accounting information in the B-share market had no substantial changes. Using a constant sample, control variables on firm features, and measures of traders' behavior, we obtain robust results. These findings have implications for policymakers on recent moves toward replacing local GAAP with the IAS.

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Keywords: Value relevance; Accounting information; Market segmentation; IAS; Chinese GAAP; Emerging markets

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1. Introduction

In this paper, we investigate the difference in the value relevance of accounting information in the A-share and B-share Chinese stock markets.¹ Consistent with recent studies in the literature (e.g., Chang, 1999; Core, Guay, & Buskirk, 2003; Francis & Schipper, 1999; Kothari & Shanken, 2003), we define the value relevance of accounting information as the ability of accounting numbers to summarize the information underlying the stock prices. Our paper compares the value relevance of accounting information prepared under international standards for international investors with that under domestic accounting standards for domestic investors. Specifically, we conduct cross-sectional analysis on the difference between the A-share market and the B-share market, and annual cross-sectional analysis on the variation of value relevance of primary accounting information over time.

The relative value relevance of accounting information in the A-share and B-share markets, which are prepared and audited, respectively under the Chinese generally accepted accounting principles (Chinese GAAP) and the international accounting standards (IAS), has implications for the recent moves toward the IAS replacing local GAAP. A-shares and B-shares are two types of public shares in China. A-shares are denominated in RMB and issued only to Chinese citizens, while B-shares are denominated in U.S. dollars on the Shanghai Stock Exchange or in Hong Kong dollars on the Shenzhen Stock Exchange and issued only to foreign residents before year 2001.² Both A-shares and B-shares convey equal rights to the same company though they are different in terms of ownership (Fung, Lee, & Leung, 2000). However, A-share investors receive accounting information prepared under the Chinese GAAP and audited by local CPA firms, while B-share investors receive accounting information prepared under the IAS and audited primarily by international accounting firms. This diversity exists even for the firms issuing both A-shares and B-shares. Therefore, Chinese emerging markets provide a unique environment that allows us to examine whether accounting information issued by the same company and prepared and audited under the IAS has higher value relevance than that prepared under local GAAP.

This paper is motivated by recent research in the value-relevance literature and developments in stock markets and accounting practices in China. In accounting literature,

¹ The basic reason for excluding H-shares in our study is that companies listed on the Hong Kong Stock Exchange are required to prepare their financial statements under Hong Kong accounting standards. Thus, the inclusion of H-shares could blur the implication of our study regarding the relative advantage of implementing IAS or domestic GAAP. Besides, the Hong Kong Stock Exchange has more developed trading mechanisms than the domestic Chinese exchanges. However, as a sensitivity test, we also include the H-shares in our sample. The results of combining B-shares and H-shares were not qualitatively different from the results of using only B-shares.

² Since February 19, 2001, B-shares have been sold to domestic investors who have foreign currency accounts. However, the market segments still remain because (1) the foreign-currency market is administered by the China Bank, the only place individuals could trade authorized amounts; (2) foreign investors have little access to the A-share market, and they still receive the accounting information prepared and audited under IAS. The major purpose of the paper is to investigate the role of Chinese GAAP vs. IAS regarding the value relevance of accounting information, but not the role of market segmentation.

earnings and book values have been empirically shown as significant variables in explaining stock price and price changes (e.g., Barth, Beaver, & Landsman, 1998; Burgstahler & Dichev, 1997; Collins, Maydew, & Weiss, 1997). In the emerging A-share and B-share markets, however, the value relevance of accounting information has been questioned. Accounting information based on domestic standards may be considered noisy because of sloppy accounting, inadequate regulation, and crony capitalism (Fox, 1998; Rask, Chu, & Gottschang, 1998). Besides, accompanying the rapid development of securities markets are some inevitable problems such as lagging legislation issues and multiple regulatory authorities (Liu & Zhang, 1996). However, the institutional changes in emerging markets, including the reform of the accounting-information system, could increase market liquidity, reduce transaction cost, and improve pricing efficiency (Feldman & Kumar, 1995). In addition, the paucity of competitive information sources other than accounting information, and the relative short-term horizon of Chinese investors could influence the value relevance of accounting information. Thus, it is an impending empirical issue whether or not the accounting information is relevant to the investors' decisions in these emerging markets.

Only recently have researchers begun to pay attention to the value-relevance issue of accounting information in the Chinese emerging markets. Chen, Chen, and Su (2001) investigated the value relevance of accounting information in the A-share market. Using a sample of all A-shares listed in the period from 1990 to 1997, they found both book value and earnings are value relevant in the A-share market under the price model and the return model.

Haw, Qi, and Wu (1999) studied the value relevance of accounting information in B-share and H-share markets. Based on the entire population of B-shares and H-shares from 1994 to 1996, they found positive and significant results for earnings under the Chinese GAAP in return models but did not find any significant results on the reconciliation items. Thus, they concluded that IAS and Hong Kong GAAP did not provide incremental information to foreign investors. Instead of using reconciliation items as a proxy for the incremental value of the IAS, Bao and Chow (1999) used the Davidson-MacKinnon *J*-test to study whether B-share markets incorporate more IAS than Chinese GAAP accounting information.³ They obtained opposite results and found that along with A-share accounting information, the estimated B-share prices from the IAS model is significantly related to the actual B-share prices, indicating that the IAS model has additional explanatory power over that contributed by the Chinese GAAP model. Hence, they concluded that, for international investors, book value and earnings reported under the IAS have greater information content than those based on the Chinese GAAP. However, Hu (2002) repeated Bao and Chow (1999) by focusing on companies only listed on the

³ Bao and Chow (1999) compared the following two sets of modified price models: the IAS Model and the Chinese GAAP Model. The Chinese GAAP Model is a regression of B-share prices on earnings and book value based on Chinese GAAP and estimated B-share prices from the IAS Model; and the IAS Model is a regression of B-share prices on earnings and book value based on the IAS and estimated B-share prices from the Chinese GAAP Model. Hence, their results are only related to the relevance of IAS and Chinese GAAP accounting information for B-shares and do not address the issue of A-shares versus B-shares.

Shanghai Stock Exchange and found that book value and earnings reported under the Chinese GAAP have greater information content than those based on IAS.

Other than the difference in the samples, one primary reason for the mixed results of the studies cited might be problems in the design problems of their research models. For instance, Chen et al. (2001) point out that the implication of the Haw et al. (1999) model is inconsistent with the disclosure practice. Haw et al. (1999) examined the association between market price in the B-share market and accounting information in the A-share market, but in disclosure practice reconciliation of discrepancy in GAAP is disclosed only in the A-share reports. B-shareholders in the B-share market receive a complete set of financial statements prepared under IAS.⁴ Consequently, problems in the research design, which lead to mixed results, require further research to shed light on the empirical question of whether the usefulness of accounting information under IAS is the same as under Chinese GAAP.

Abdel-Khalik, Wong, and Wu (1999) investigated the association between earnings and share prices of A- and B-shares using an event study. Their sample included 2 years observations over 1994–1995. Contrary to their expectations, they found significant association between earnings and abnormal returns for A-shares but not for B-shares. They attributed their results to high price volatility, dominance of government officials, and the thin trading volume in the B-share market. Besides Abdel-Khalik et al. (1999), no other study has directly examined the relative value relevance of accounting information prepared under IAS for the B-share market versus that prepared under Chinese GAAP for the A-share market. For instance, Eichenseher (2000) examined the role of book value in pricing securities on the Shanghai Stock Exchange from 1996 to 1997 and found that earnings were relevant to prices in both markets while book values were not. However, he did not directly address whether there is any difference in the value relevance of primary accounting information between the two different market segments other than whether book value or earnings are relevant to the pricing process. In one recent working paper, Chen, Firth, and Kim (2003) showed the same concern and tried to address this issue by examining the value relevance of the accounting information under Chinese GAAP and the reconciliation under IAS in the two segments. However, they did not directly address the difference in the value relevance of primary accounting information between the two different market segments other than the information content of reconciliation.

In this study, we directly investigate the relative value relevance of accounting information in the two segments to provide further evidence on the value-relevance issue in the emerging market. Our basic intention is to test whether the two market segments

⁴ B-share investors can access the A-share information, including the reconciliation from Chinese GAAP to IAS, if they are interested in it. However, B-share investors may be uninterested in the reconciliation data simply because they are more interested in the complete financial-statement information prepared and audited under the IAS. Otherwise, it is difficult to explain the motivation for public companies being required to prepare their financial statements under IAS and invite Big Six (now Big Four) companies to audit their financial statements. In other words, although the reconciliation data issued to A-share investors are costless to obtain, we could not see the motivation of B-share investors to obtain the information, while they have access to the full financial statements prepared under IAS and audited by Big-six auditing firms. Based on this reasoning, the reconciliation data should not have any direct relationship with B-share price activities, which is also pointed out by Chen et al. (2001).

differently value the major accounting information disclosed by the same company, but not to test whether and how one market segment values the major accounting information—such as whether the A-share market values the accounting information of firms with foreign investors (firms issuing both A- and B-shares) more than others (A-share only firms) as in Chen et al. (2001), or whether the B-share market values accounting information under IAS more than that under Chinese GAAP as in Bao and Chow (1999).

Following most studies in the value relevance literature, we use the price model in this paper.⁵ The relative significance of coefficients and explanatory powers of the models in the A-share market and the B-share market, as well as their relative significance over time, are assessed through respective *t*-statistics, the Christie (1990) Z-test, R^2 , and the Cramer (1987) test. The results indicate that accounting information is relevant to the pricing process in both the A-share and B-share markets. Also, the accounting information in the B-share market is more value relevant. This result points to the superiority of accounting information prepared under the IAS and audited by international auditors versus those prepared under domestic GAAP and audited by local auditors in the pricing of stocks. In addition, for the A-share market, there is some evidence that the value relevance of accounting information significantly increased since 1996, although this increase was modest when domestic investors became familiar with the accounting information.

The remainder of the study proceeds as follows. Section 2 presents the background of A-share and B-share stock markets, reviews the related research, and develops hypotheses for the study. Models and empirical testing are discussed in Section 3. Section 4 reports on the data collection and results. Implications and limitations of the study, as well as the perspective for future research, are addressed in Section 5.

2. Backgrounds and hypotheses development

2.1. Institutional background

2.1.1. Development of the Chinese stock market

The Chinese stock exchanges have expanded rapidly since the two national securities markets—the Shanghai Stock Exchange and the Shenzhen Stock Exchange—were established in 1990 and 1991, respectively. The numbers of publicly listed companies mounted from 14 in 1991 to 1059 in December 2000, with an increasing trading volume. The rapid growth of stock companies and stock markets is illustrated in Table 1.⁶

In addition to shares issued to domestic investors (called A-shares), after 1992, companies were allowed to issue shares to foreign investors (called B-shares) through the two national exchanges. B-shares and A-shares are listed and traded on both exchanges. As illustrated in Table 2, up to December 2000, 114 Chinese companies had issued B-

⁵ We also investigate the return model and find qualitatively similar results as reported under the price model.

⁶ According to the China Daily Press (June 2, 2001, Sunday), on May 25, 2001, the value of market capitalization of the two Chinese exchanges exceeded that of the Hong Kong Exchange for the first time. This made the Chinese stock market the second largest Asian capital market, second only to Japan.

Table 1

Overview of A-share stock trading (1991–2000)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number of listed companies	14	53	183	288	312	515	720	826	924	1059
Market capitalization (in 100 billion RMB)	0.109	1.048	3.531	3.515	3.317	9.475	17.078	19.185	26.173	47.615
Annual trading volume (in 100 billion shares)	0.003	0.038	0.234	0.999	0.685	2.483	2.491	2.109	2.807	4.556
Annual trading amount (in 100 billion RMB)	—	—	—	8.116	39.912	21.257	30.500	23.529	30.940	60.156

Source: data from 1991 to 1993 are from Lin, Yang, and Wang (1998), *Accounting and Auditing in China*, 75 pp. Data from 1994 to 2000 are calculated based on data from the *Taiwan Economic Journal Database*.

shares, with market capitalization of 61.1 billion RMB.⁷ In general, the rapid development of the stock markets contributes to the reform of the investment system and the privatization of state-owned enterprises, but it also produces problems such as insufficient institutional supports, lagging legislation and multiple regulation authorities (Liu & Zhang, 1996).

2.1.2. Accounting information disclosure practice and the Chinese GAAP

To standardize the disclosure practice, in 1992, the Ministry of Finance and the State Commission for Economic Reforms issued Accounting System for Companies with Listed Shares, the first accounting regulation for listed companies. Listed companies are also subject to the Bylaws of Information Disclosure for Publicly Traded Companies (issued in 1993) and the Content and Format of Annual Reports (issued in 1994 and revised in 1997), which were issued by the Chinese Securities Regulatory Commission (CSRC).

The issuance of Accounting Standard for Enterprises No. 1—Basic Standards (ASFE, issued by the Ministry of Finance in 1992) represented the first step to bring Chinese accounting in line with international practice and the IAS (Liu & Zhang, 1996; Winkle, Huss, & Chen, 1994; Xiang, 1998). These standards, while familiar to outside investors due to their familiarity with the IAS, were new to domestic investors.⁸ Following the ASFE, a series of specific accounting standards was scheduled and issued. From May 1997 to December 2001, there were 16 specific standards promulgated. A series of auditing standards was also issued to regulate the auditing practice, starting in 1996 (DeFond, Wong, & Li, 2000). These standards were claimed to improve corporate-accounting disclosure both in terms of quality and quantity.

However, there are still some differences between the Chinese GAAP and the IAS. For instance, the Chinese GAAP has a more restrictive policy on estimating the bad debt

⁷ To achieve the comparability of data across different segments of the market, all data are converted into RMB. The U.S. dollar prices of the Shanghai B-shares are translated into RMB at the rate of 8.29 RMB per U.S. dollar, and the HK dollar prices of the Shenzhen B-shares are translated into RMB at 1.07 RMB per HK dollar. These currency rates have been held roughly constant by the Chinese government in recent years (Eichenseher 2000). We also used the exchange rate on the same trading date and the results are qualitatively the same.

⁸ However, it is also recognized that there are certain variations from western standards. For example, ASFE is less detailed and less complex than western standards, especially in the omission of many complex liability issues. For details, see Winkle et al. (1994).

Table 2
Overview of B-share stock trading (1993–2000)

	1993	1994	1995	1996	1997	1998	1999	2000
Number of listed companies	40	58	70	85	101	107	108	114
Market capitalization (in 100 million RMB)	148	133	134	346	356	216	331	611
Annual trading volume (in 100 million RMB)	16	25	31	71	88	61	123	201
Annual trading amount (in 100 million RMB)	310	914	539	990	2056	756	1346	3204

Source: calculation based on data from the Taiwan Economic Journal Database.

expense, depreciation expense, measuring inventory, and investment.⁹ These differences, along with the differences in auditing practices and professional judgments by domestic auditors versus international auditors, cause the major differences between the domestic financial reports in the A-share market and those based on IAS in the B-share market.

Under these regulations, listed companies prepare their financial statements based on the Chinese GAAP, as well as the IAS if they also issue B-shares. They should have their annual reports audited by authorized CPAs and submit copies to government agencies, such as state-owned-asset management agencies, tax authorities, securities regulatory agencies, and banks. They are also required to have copies available for investors. In addition, listed companies are required to publish their annual reports in at least one of the authorized securities' publications before April 30th the following year.¹⁰ For companies with both A-shares and B-shares, the audited annual reports for B-share investors are published in Hong Kong on the same day as those for A-share investors in China. The reconciliation information on the two sets of accounting statements is released to only A-share investors, but not to B-share investors.

2.2. Hypotheses development

Although there are shares similar to A-shares and B-shares in other countries (Bailey & Jagtiani, 1994; Domowitz, Glen, & Madhavan, 1998), pricing behavior in Chinese A-share and B-share markets is unique (Fung et al., 2000). In other countries, the price of B-shares is higher than the price of A-shares, whereas B-shares in China are traded at a discount rate (Bailey & Jagtiani, 1994; Wo, 1997). In addition, Fung et al. (2000) argue that the inconsistent impact of political factors on the stock markets, as well as price volatility, could reflect market segmentation. Using the latent variable-asset-pricing model, Fung et al. (2000) found that the latent risk premiums for the A-shares and B-shares were only weakly correlated, and they concluded that the two markets reflected different fundamental forces.¹¹

⁹ For detailed information on the difference between Chinese GAAP and IAS, see Table 1 and footnote 2 of Bao and Chow (1999).

¹⁰ Chinese companies are required to use the calendar year as their fiscal year.

¹¹ For instance, the Shanghai A-share index jumped up by 113% from July 29, 1994 to August 5, 1994, and by 208% to September 16, 1994. A similar situation happened to the Shenzhen A-share index. In contrast, neither the Shanghai nor the Shenzhen B-share indices experienced similar growth in the same periods. The price changes could be primarily attributed to the announcement that in the A-share market foreign companies were allowed to set up joint mutual funds with local companies. Thus, the A-share market was expecting foreign money to enter and responded immediately to the news.

The dual reporting and auditing systems affect the value relevance of accounting information in the two market segments. Companies issuing A-shares prepare their Chinese-GAAP-based accounting statements that are then audited by local CPA firms. Companies issuing B-shares are required to follow the IAS in preparing accounting statements and usually have these audited by international CPA firms. When there is a discrepancy between the two sets of audited financial reports, companies issuing both A-shares and B-shares need to reconcile their accounting statements with the IAS for domestic investors. Because the IAS is considered to be of higher quality than local GAAP, and international auditors such as Big Five (Big Four) firms are thought to provide higher quality audits than their Chinese counterparts (Chui & Kwok, 1998; DeFond et al., 2000; Lam & Jing, 2000), the accounting information in the B-share market should be more relevant to the pricing process, compared with its counterpart in the A-share market.

Based on the discussion above, we develop the following hypotheses:

H1a (*In alternative form*). The accounting information is value relevant in both A-share and B-share markets.¹²

H1b (*In alternative form*). The value relevance of accounting information in the B-share market would be higher than in the A-share market.

3. Research design

3.1. Models

In accounting literature, some studies support the value relevance of accounting earnings (e.g., Ball & Brown, 1968; Collins & Kothari, 1989; Kothari & Zimmerman, 1995), while others indicate that stock price is associated with the book value of firm assets, assuming that measures of assets and liabilities imply the expected results of future activities (e.g., Barth, 1991; Shelvin, 1991). In these studies, the models based on earnings and those based on book values are typically viewed as alternative approaches to valuation models (e.g., Barth & Landsman, 1995; Solomons, 1995), especially under the assumption of a complete and perfect market.

However, recent studies argue that in more realistic settings with market imperfections, accounting systems can provide information about book value and earnings which are complementary, rather than redundant, components of equity value (Chang, 1999; Feltham & Ohlson, 1995; Ohlson, 1995; Pennman, 1998). Using the concepts of adaptation value and recursion value, Burgstahler and Dichev (1997) explicitly argue that book value provides the net value of the firm's resources primarily in terms of historical cost and it is largely independent of the success with which the firm currently employs its resources. In contrast, earnings provide a measure of value that reflects the results of employing firms' current resources. Hence, a multivariate valuation model is preferred to a univariate one.

¹² Hypothesis 1a is stated to test the consistency of the data with prior studies. Though this hypothesis is not new, we think it is important to include it in the study since Hypothesis 1b would be unnecessary if Hypothesis 1a does not hold.

Following Burgstahler and Dichev (1997) and Barth et al. (1998), this study uses the price model to test the relationship between price and accounting information. In such a valuation model for equity securities, price is a weighted linear combination of book value and earnings per share, and other non-accounting information about future abnormal earnings:

$$P_t = a_0 + a_1 BV_t + a_2 E_t + a_3 V_t + e \quad (1)$$

Where P_t is the price per share at time t , BV_t is book value per share at time t , E_t is earnings per share for the period ending at time t , and V_t is other non-accounting information about future abnormal earnings per share available at time t .

Assuming that BV and E are not correlated with unobserved V , the explanatory power of a regression of P on BV and E can be taken as a measure of the materiality of V . Thus, a high level of R^2 in the regressions suggests that investors use accounting information in their decisions (Eichenseher, 2000).

3.2. Research design

To test the hypotheses, we estimate the model separately for the A-shares and B-shares using pooled samples as well as yearly samples. That is, we estimate the following two models with a superscript indicating the particular share:

$$P_t^A = a_{0t}^A + a_{1t}^A BV_t^A + a_{2t}^A E_t^A + e_t^A \quad (2a)$$

$$P_t^B = a_{0t}^B + a_{1t}^B BV_t^B + a_{2t}^B E_t^B + e_t^B \quad (2b)$$

For the A-share model, we use all the data disclosed under Chinese GAAP and for the B-share model, we use all the data disclosed under IAS. We expect that the value relevance of accounting information would be higher in the B-share market than in the A-share market. Hence, the related R^2 are expected to be higher in the B-share market than in the A-share market. Also, t -statistics of a_{1t}^A and a_{2t}^A are expected to be significantly lower than those of a_{1t}^B and a_{2t}^B , respectively. We use the respective t -statistics and the Christie (1990) Z -tests to address the relative significance of coefficients in the A-share and the B-share markets. While prior studies (e.g., Collins et al., 1997; Francis & Schipper, 1999) provided intuitive R^2 comparisons, the lack of test statistics places limitations on assessing the strength of the findings. Therefore, we use the Cramer (1987) test to test for the difference in the adjusted R^2 .

Because the estimations are made over many observations of the same firms in each cross-section, there is a lack of independence between t -statistics. Christie (1990) developed Z -statistics that allow an assessment of the level of significance. In this test, a Z -statistic under an assumption of cross-correlation is calculated, based on the reported Z -statistic and the average degree of cross-correlation. Since the degree of cross-correlation cannot be directly calculated, this study calculates Z -statistics under both the assumption of zero correlation and that of perfect correlation.¹³

¹³ According to Christie (1990), the small number of time-series observations typically precludes the use of actual sample correlation to calculate the Z -statistics.

Brown, Lo, and Lys (1999) argue that the between-sample comparisons of R^2 from regressions of stock prices on per-share value of accounting earnings and book value are invalid unless one controls for difference in the scale factor's coefficient of variation. In their study, they examine the changes in R^2 of time, that is, the between-year comparisons of R^2 from annual regressions of the price model. Our comparison of R^2 between A-shares and B-shares does not suffer from this problem simply because the deflator is total outstanding shares of the company, which is the same for the A-share sample and B-share sample since we use companies issuing both A-share and B-share. Therefore, there is no difference in the scale factor's coefficient of variation (scale factor in this case is total outstanding shares) between the two groups.¹⁴

4. Data collection and analysis

4.1. Data collection

The sample selection starts with the entire population of A-shares and B-shares from the Taiwan Economic Journal (TEJ) Database. For comparison, the sample is comprised of 81 industrial firms that issued both A-shares and B-shares on the Shanghai Stock Exchange or the Shenzhen Stock Exchange before December 2000. For these companies, after deleting firm-year observations with missing data, there are 401 A-share observations and 401 B-share observations with both financial and price data available from the TEJ Database.¹⁵ The data on price, book value, and earnings are further truncated at two standard deviations to reduce the effect of outliers.¹⁶ Table 3 presents the distributions of sample firms by exchange and by year.

4.2. Results

Table 4 presents descriptive statistics for the variables. The market data for A-shares and B-shares are based on the dividend-adjusted prices, provided by the TEJ

¹⁴ However, the between-year comparison of R^2 in A-share markets may suffer from this issue because the number of outstanding shares (scale factor) is changing over time and so is its coefficient of variation. We are not able to repeat Brown et al. (1999) study to investigate whether the changes in R^2 over time are caused by the difference in the scale factor's coefficient of variation over time simply because of the limited observations in our sample (only less than 10 years). Nevertheless, our results of using a different scale (book value) are qualitatively the same, which implies that our conclusion based on the price-per-share model may not be significantly biased due to the potential specification problem regarding the between-sample comparisons of R^2 . In addition, using R^2 as a measure of value relevance is consistent with several recent studies (Core et al., 2003; Kothari & Shanken, 2003).

¹⁵ Excluded are financial firms (banks and insurance companies). According to previous studies, the specific financial attributes of these firms could result in a different information content of their earnings. For the purpose of comparison, also excluded are the firm-year observations when the firm only has A-shares or B-shares (some firms issued A-shares and B-shares in different years).

¹⁶ As sensitivity analysis, the data are truncated at three and four standard deviations as well. However, the results qualitatively remain the same.

Table 3
Sample distribution

Year	Shanghai Stock Exchange	Shenzhen Stock Exchange	Total
1994	25	14	39
1995	25	21	46
1996	27	28	55
1997	29	29	58
1998	33	33	66
1999	34	33	67
2000	34	36	70
Total	207	194	401

Database.¹⁷ Accounting data for A-shares are from the Chinese GAAP-based financial statements, and those for B-shares are from the IAS-based financial statements.

The average price of A-shares is 9.998 (with a median of 8.825), and that of B-shares over the same period is 3.266 (with a median of 2.016). This is consistent with prior studies that show that B-shares in China are generally traded at a discount relative to A-shares (Bailey & Jagtiani, 1994; Wo, 1997). There are some differences in earnings (*E*) and book value (*BV*) between A-shares and B-shares. The mean of earnings is lower for the B-shares, which indicates that the IAS is more conservative in recognizing earnings than the Chinese GAAP. The mean book value is also lower for B-shares. Finally, the A-share trading volume is higher than the B-share trading volume, which might mean that the demand was low in the B-share market.

The Pearson bivariate correlation coefficients and *p*-values are presented in Table 5. These results provide preliminary evidence that prices are positively related to book value and earnings for both the A-shares and B-shares.¹⁸ In addition, consistent with H1b, the price correlation with earnings and book value is much higher for B-shares compared to those for A-shares on an overall basis (Table 5) or year-by-year basis as plotted in Figs. 1 and 2. In general, correlations among the independent variables are not high except for the correlation between book value and earnings, which is slightly higher than 0.70. Because these are the two major variables of the price model, no attempt is made to exclude either one from the model. In addition, the correlation between the IAS and Chinese GAAP income numbers is 96% and that between book values is 97% (not reported in the tables).

Table 6 presents the slope coefficients, *t*-statistics, differential *t*-statistics, the Christie (1990) *Z*-statistics, and the Cramer (1987) test for models (2a) and (2b). The columns report the slope coefficients and the related *t*-statistics in parentheses, adjusted R^2 and *F*-statistics for A-shares, those for B-shares, the differential *t*-statistics, and the Cramer

¹⁷ Because the deadline to publish the annual reports is April 30th in the following year, we use the price on the last trading day of the month of April of the subsequent year.

¹⁸ The test for normality indicates that the data do not depart, to any significant degree, from the normal distribution.

Table 4
Descriptive statistics

Variable	Mean	S.D.	Minimum	Median	Maximum
<i>Panel A. A-shares</i>					
<i>P</i>	9.998	4.744	1.521	8.825	20.582
<i>E</i>	0.215	0.350	−0.651	0.197	1.051
BV	2.547	1.059	0.070	2.379	5.073
<i>Panel B. B-shares</i>					
<i>P</i>	3.266	2.723	0.431	2.016	9.542
<i>E</i>	0.174	0.364	−0.706	0.156	1.026
BV	2.493	1.207	−0.510	2.316	5.577

Definitions: *P* is the price per share at the end of the fourth month after fiscal year *t*; BV is book value per share at the end of fiscal year *t*; *E* is earnings per share for fiscal year *t*.

(1987) test. The mean of differential *t*-statistics and Christie (1990) Z-statistics are reported at the bottom of the table.

For the pooled sample, the GLS estimates (and White *t*-tests) are reported to solve the heteroscedasticity and autocorrelation problems. According to the *F*-test, both models are highly significant. The two independent variables (BV and *E*) have different significant levels in the two markets. The year-by-year regressions show that the model performs well for B-shares in all years and for A-shares in most of the recent years, as suggested by highly significant *F*-statistics. BV is significantly associated with A-share prices in later years except year 2000. For the B-share market,

Table 5
Pearson correlation coefficients

	<i>P</i>	<i>E</i>	BV
<i>Panel A. A-shares</i>			
<i>P</i>	1.000 0.000		
<i>E</i>	0.171*** 0.001	1.000 0.000	
BV	0.169*** 0.001	0.708*** 0.000	1.000 0.000
<i>Panel B. B-shares</i>			
<i>P</i>	1.000 0.000		
<i>E</i>	0.331*** 0.000	1.000 0.000	
BV	0.314*** 0.000	0.715*** 0.000	1.000 0.000

Definitions: *P* is the price per share at the end of the fourth month after fiscal year *t*; BV is book value per share at the end of fiscal year *t*; *E* is earnings per share for fiscal year *t*; *, **, *** statistically significant at 0.10, 0.05, and 0.01, respectively.

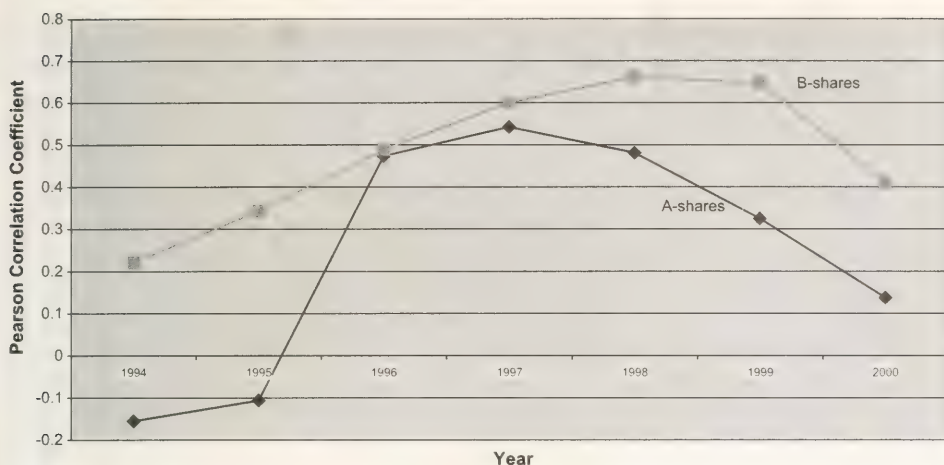


Fig. 1. Pearson correlation coefficients between price (P) and book value (BV).

E is significantly associated to B-share prices over all years in the study and so is BV after year 1997. The results are consistent with Hypothesis 1a, which proposes that accounting information is relevant to the pricing process in both A-share and B-share markets.

In the pooled A-share and B-share samples, both BV and E are significantly related to prices. The coefficient for A-shares' earnings (E) is only marginally significant, which suggests that domestic investors relied more on BV to make their decisions. The yearly analysis further indicates that the marginal significance of

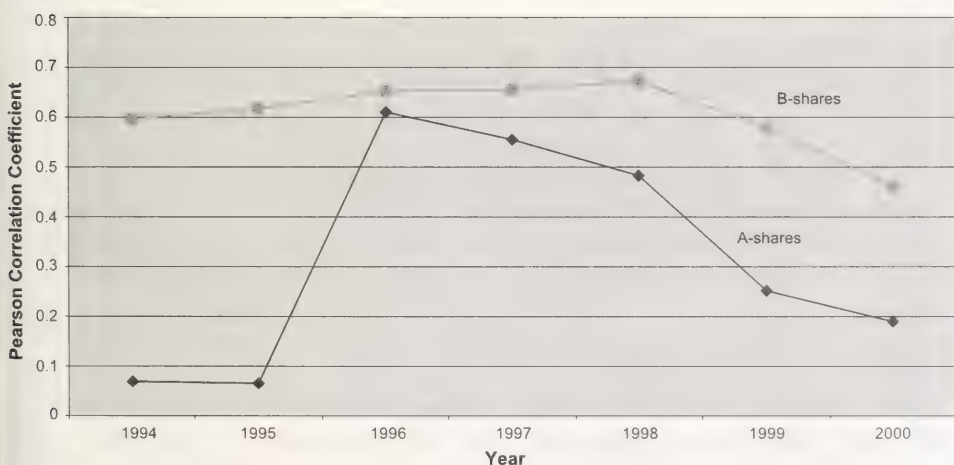


Fig. 2. Pearson correlation coefficient between price (P) and earnings (E).

Table 6

Value relevance in A-share market vs. B-share market: regression results for models (2a) and (2b)

	Model (2a)			Model (2b)			Cross-sectional differential <i>t</i> -statistics ^a		Cramer (1987) test	
	BV	<i>E</i>	Adj. <i>R</i> ²	<i>F</i> -statistics	BV	<i>E</i>	BV	<i>E</i>	Model (2a)	Model (2b)
<i>Pooled sample (GLS)</i>										
1994	0.426 (4.551)***	1.406 (1.616)*	0.029	6.957	0.358 (11.257)***	1.662 (7.238)***		6.706	0.005	0.005
1995	-0.909 (-1.197)	1.876 (0.840)	-0.010	0.806	-0.054 (-0.739)	2.097 (4.142)***			0.050	0.061
1996	-0.641 (-1.114)	1.428 (0.959)	-0.013	0.703	-0.073 (-0.438)	1.924 (4.307)***	0.458	3.302	0.043	0.055
1997	0.721 (0.858)	7.235 (3.630)***	0.357	10.269	0.145 (0.407)	3.871 (4.100)***	0.676	3.348	0.047	0.050
1998	1.356 (2.767)***	3.872 (1.097)	0.315	14.112	0.403 (1.243)	2.366 (2.873)***	-0.451	0.470	0.042	0.049
1999	0.638 (4.984)***	1.827 (0.824)	0.232	10.862	0.303 (2.395)***	1.041 (2.757)***	-1.524	1.776	0.034	0.049
2000	0.987 (3.589)***	0.143 (0.074)	0.078	3.785	0.368 (3.395)***	0.542 (1.437)*	-2.589	1.933	0.031	0.043
Mean cross-sectional <i>t</i> -statistics	-0.069 (-0.372)	2.497 (0.586)	0.067	1.253	0.146 (5.104)***	1.856 (2.859)***	-0.194	1.363	0.029	0.032
Christie (1990) Z-statistics under zero-correlation assumption							5.476	2.273		
Christie (1990) Z-statistics under perfect-correlation assumption							0.265	2.066		
							0.689	5.356***		
							0.260	4.024***		

Definitions: *P* is the price per share at the end of the fourth month after fiscal year *t*; BV is book value per share at the end of fiscal year *t*; *E* is earnings per share for fiscal year *t*; *, **, *** statistically significant at 0.10, 0.05, and 0.01, respectively.

^a The differential *t*-statistics for BV(*E*) of B-shares minus the *t*-statistics for BV(*E*) of A-shares. The results of the White *t*-test are reported when there is a heteroscedasticity problem.

earnings in the pooled A-share sample is driven by the observations in year 1996, while the earnings of B-shares are always significantly related to the prices over all years. This might be reasonable if domestic investors perceive earnings management behavior by listed companies in response to security regulations (Haw, Wu, & Zhang, 1998).¹⁹

To meet the required return-on-equity ratio for public offerings or to reduce the risk of suspension, the managers could execute transactions or manage accounting accruals. If domestic investors perceived these earnings-management behaviors, they might ignore the information content of earnings in making their decisions.

Comparing A-shares with B-shares, the R^2 for pooled samples and yearly samples (as plotted in Fig. 3) suggest that in the B-share market the value-relevance level of accounting information is always higher than in the A-share market, as expected by Hypothesis 1b. Results of cross-sectional differences in t -statistics show the B-share accounting information has higher value relevance than A-share. The mean t -statistics' differences between B-shares and A-shares for BV and E are both positive. The Christie (1990) Z -test indicates that under the zero-correlation assumption, the average difference in t -statistics is significant for E ($p < 0.01$) but not for BV. However, the zero-correlation assumption is more likely unreasonable in that many of the same firms are in the cross-sectional sample in more than 1 year. The differential t -statistics for E remains significant at $p < 0.01$ under an assumption of perfect correlation and that for BV remains insignificant. The true significance level obviously lies somewhere between the two extremes.

We calculate the standard deviation of the estimated R^2 of each model, suggested by Cramer (1987) and also used by Ball, Kothari, and Robin (2000), to check the significance of the differences in R^2 . According to Cramer (1987), the estimated R^2 is a function of sample size, the number of independent variables, and the true R^2 . For three independent variables including intercepts, a true R^2 of 2.9% and the sample size of 401, the standard deviation of the estimate is 0.5%. For a true R^2 of 11.7%, it is 0.5%. Thus, the pooled A-share sample R^2 is significantly smaller than that of the pooled B-share. The standard deviations of the R^2 estimates for the A-share annual samples range from 3% to 5%, while those for B-shares range from 3% to 6%. Therefore, the R^2 for A-share annual samples are all significantly smaller than their counterparts for B-share annual samples, except for year 1996.

Overall, the results indicate that the accounting information is associated with the prices in both A-share and B-share markets, consistent with Hypothesis 1a. In addition, the explanatory power manifested in adjusted R^2 of earnings and book value for B-shares is higher than that of A-shares. Also, B-share earnings, in terms of magnitude of significance, show a significantly higher degree of relevance than A-share earnings. These results support Hypothesis 1b.

¹⁹ Book values may also be affected by earnings management, given that clean surplus relation would hold in most cases under PRC GAAP. However, the noise created by earnings management is, usually, more severe for earnings than book value due to their relative magnitude. Hence, there is more impact on the information content of earnings.

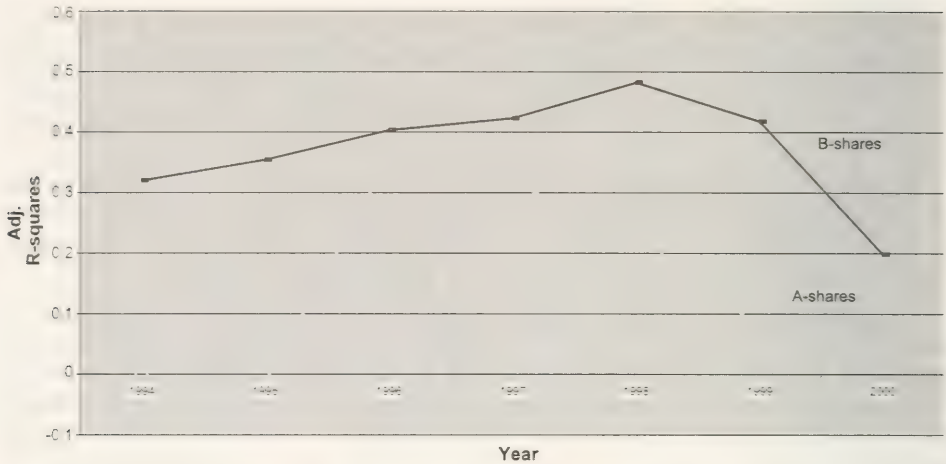


Fig. 3. Adj. R^2 from estimating models (2a) and (2b) by year.

4.3. Additional test: value relevance over time

In this section, we test whether the value-relevance level has significantly changed over time in the two markets. The continuous economic reform and related institutional reform could improve the accounting and auditing functions, modify the disclosure practices, and improve the investors' decisions. Therefore, in the emerging market, there is an increase in the usefulness of accounting information for investors' decision making, which is suggested by Jermakowicz and Gomik-Tomaszewski (1998). Their results from the Warsaw Stock Exchange in Poland indicated that the value relevance of earnings was insignificant in 1995 when National Investment Funds were first created, while in 1996 and 1997 it became significant. Thus, we also expect that in the Chinese A-share market more domestic investors would use accounting information in later years, and they would rely on accounting information more frequently. However, B-share investors receive financial statements prepared under the IAS and audited by international CPA firms; hence, they might rely on the disclosed information constantly. As a result, the value relevance of accounting information in the B-share market might show no significant changes in later years.

Table 7 presents the year-by-year comparisons of t -statistics and the Christie (1990) Z -statistics for the time-series differences. The adjusted R^2 values for A-shares are very low in the first 2 years, peak in 1996, and remain high in 1997 and 1998, then decrease substantially in the last 2 years, which is consistent with prior studies on A-shares (e.g., Chen et al., 2001). By contrast, the adjusted R^2 values for B-shares show no substantial changes over the years except in 2000 (an unusual year discussed later). This is reasonable because international investors consistently received accounting information based on the IAS. With recent changes in China's regulatory environment, one might expect to see an increase in the relevance of accounting information for A-shares. The empirical effects of these changes may be primarily incremental for our sample, however. In addition, the A-

Table 7

Value relevance over time: regression results for models (2a) and (2b)

Time-series differential <i>T</i> -statistics ^a	Model (2a)				Model (2b)			
	BV (2a)	<i>E</i> (2a)	Adj. R^2	Cramer (1987) test	BV (2b)	<i>E</i> (2b)	Adj. R^2	Cramer (1987) test
1994 vs. 1995	0.083	0.119	−0.010 vs. −0.013	0.050 vs. 0.043	0.301	0.165	0.320 vs. 0.354	0.061 vs. 0.055
1995 vs. 1996	1.972	2.671	−0.013 vs. 0.357	0.043 vs. 0.047	0.845	−0.207	0.354 vs. 0.403	0.055 vs. 0.050
1996 vs. 1997	1.909	0.357	0.357 vs. 0.315	0.047 vs. 0.042	0.836	−1.227	0.403 vs. 0.423	0.050 vs. 0.049
1997 vs. 1998	2.217	−0.273	0.315 vs. 0.232	0.042 vs. 0.034	1.152	−0.116	0.423 vs. 0.482	0.049 vs. 0.049
1998 vs. 1999	−1.395	−0.75	0.232 vs. 0.078	0.034 vs. 0.031	1.000	−1.320	0.482 vs. 0.418	0.049 vs. 0.043
1999 vs. 2000	−3.961	0.512	0.078 vs. 0.067	0.031 vs. 0.029	1.709	1.422	0.418 vs. 0.199	0.043 vs. 0.032
Adjusted mean time-series <i>T</i> -statistics	0.138	−0.042			0.974	−0.214		
Christie (1990) <i>Z</i> -statistics under zero-correlation assumption	0.325	−0.103			2.345***	−0.514		
Christie (1990) <i>Z</i> -statistics under perfect-correlation assumption	0.133	−0.042			0.958	−0.210		

Definitions: *P* is the price per share at the end of the fourth month after fiscal year *t*; BV is book value per share at the end of fiscal year *t*; *E* is earnings per share for fiscal year *t*; *, **, *** statistically significant at 0.10, 0.05, and 0.01, respectively.

^a The differential *t*-statistics for BV(*E*) are calculated using the *t*-statistics for BV(*E*) in the year minus the *t*-statistics for BV(*E*) in the previous year. Results of the White *t*-test are reported when there is a heteroscedasticity problem.

share investors may require more time to become familiar with the new auditing and accounting standards issued and implemented from 1996 to 1999.^{20, 21} Finally, the new regulations may have less direct influence on the value relevance of accounting numbers than expected if, for example, earnings increasingly reflect news with a lag relative to other information sources or if earnings increasingly reflect good news and bad news asymmetrically (Ryan & Zarowin, 2003).

²⁰ The first batch of auditing standards was issued on December 25, 1995, and became effective on January 1, 1996. These auditing standards represent the first regulation on the auditing service in the Chinese stock markets. For detailed contents of these standards, please see www.china-cpa.com.

²¹ For instance, batches of specific accounting standards were issued in these years. These accounting standards included Disclosure of Related Party Transactions (1997), Events after the Balance Sheet Date (1998), Revenue (1999), Debt Restructuring (1999), Construction Contracts (1999), Investments (1999), and Changes in Accounting Policies and Accounting Estimates, and Corrections of Accounting Errors (1999).

The Christie (1990) *Z*-test in Table 7 indicates that (with an assumption of zero correlation) average differences in time-series *t*-statistics are positively significant for B-share BV ($p < 0.01$), but not for B-share *E*. The differential *t*-statistics for BV and *E* are insignificant under the assumption of perfect correlation. This result holds after adding volume as a control variable. The true significance level lies somewhere between the two extremes. Combined with the results of adjusted R^2 , the value relevance of accounting information in B-shares valuation does not appear to change over the years. However, the evidence for changes in the value relevance of B-shares' BV is limited. This is consistent with the notion that international investors considered B-share financial statements reliable from the start because they are prepared under IAS and usually audited by international accounting firms.

As to A-shares, the average difference in time-series *t*-statistics is not significant for either BV or *E*. This could be caused by the expectation of some unusual events in year 2000, as suggested by the relevant insignificant coefficients and low adjusted R^2 reported for this year. For instance, in February 2001, the B-shares market began to open to domestic investors who have foreign-currency accounts, which could shift funds from A-share to B-share with corresponding changes in trading volume due to the discount rate in the B-share market (Bailey & Jagtiani, 1994; Wo, 1997). In addition, besides reacting to accounting information, domestic investors might focus on short-term trading gains or trade on speculation compared to international investors. The investor's tendency to focus on short-term trading and speculation manifests itself in the volume of trade. Consequently, as suggested by Eichenseher (2000), including the trading volume in our model should control for the effects of these factors on stock prices. The modified pricing model takes the following form:

$$P_t^A = a_{0t}^A + a_{1t}^A BV_t + a_{2t}^A E_t + a_{3t}^A VOL_t + e_t^A \quad (3a)$$

$$P_t^B = a_{0t}^B + a_{1t}^B BV_t + a_{2t}^B E_t + a_{3t}^B VOL_t + e_t^B \quad (3b)$$

The results (not reported in tables) show that, as expected, the adjusted R^2 for the A-share model increased in year 2000 (increasing from 6.7% in Table 6 to 29.5%), while other years remain qualitatively the same. To further examine the effect of the trading volume in year 2000 on the overall results, additional analysis excluding year 2000 data is performed. The Christie (1990) *Z*-statistics under both assumptions indicate that the average differences in time-series *t*-statistics for A-shares BV become positively significant while those for *E* remain insignificant. Viewed together with the observed adjusted R^2 , the A-share market did present a picture of increasing value relevance of accounting information especially for BV, though the evidence for *E* is not found.

Other possible reasons for the unusual results in year 2000 could also be the expectation of some events that happened in the earlier part of year 2001: (1) the expectation of China's entering the World Trade Organizations (WTO); (2) the designation of Beijing as the site for the Olympic games, raising all Olympic-associated stocks; (3) the west development policy; and (4) the restructuring of securities markets. These events, acting as non-accounting information (V_t) in the price model, could also

drive up the stock prices since these events might enhance investors' confidence in the future of the economy.

4.4. *Additional test on alternative explanations: accounting standards or traders' behavior?*

In the previous section, we investigate and find the difference in the value relevance of accounting information in the A-share and B-share Chinese stock markets. In particular, we find that accounting information issued by the same company and prepared and audited under the IAS has higher value relevance than that prepared under local GAAP. However, the difference in the traders in the two segments could also be a factor in explaining the difference in value relevance. For instance, in the A-share market, domestic investors focus on short-term trading gains or speculations so they might rely less on accounting information. In contrast, in the B-share market, the overseas investors emphasize the intrinsic value so they might rely more on accounting information. Hence, in this section, we address the reason why the B-share market has higher value relevance than the A-share market.

As mentioned in the previous section, the trading volume in models (4a) and (4b) should, to some extent, control for the effects of investors' behavior. Domestic investors might focus on short-term trading gains or trade on speculation compared to international investors, which can be manifested in higher trading volume and trading turnover. When we use trading volume as a control variable, the results indicate qualitatively the same results as reported; implying that our results are attributable to differences in accounting standards, given that trading volume properly measures trader's behavior.

An alternative measure of the difference in trader's behavior in different markets is the synchronous stock-price movement. Morck, Yeung, and Yu (2000) hypothesize and find that stock prices move together more in under-developed economies than in developed economies because (1) political events and rumors in low-income economies could cause wide stock-price variation in the market; (2) unreported, related party transactions and insider trading in low-income economies could make firm-specific information less useful to risk arbitrageurs and hence make the firm-specific information less value relevant. If the traders are oriented toward short-term trading gains or speculations, then the traders could be more sensitive to political events and rumors and more susceptible to insider trading. Therefore, the stock-price-synchronicity measure could be a proper measure of a trader's behavior and related property-rights issues in two different segments. Following Morck et al. (2000), the stock-price synchronicity is measured by the R^2 of regression statistics for the following linear regression:

$$R_{it} = a_i + b_i R_{mt} + e_t \quad (4)$$

Where R_{it} is stock i 's return in week t and R_{mt} is a market index return. A high R^2 in this regression model indicates a high degree of stock-price synchronicity.

We calculate the stock-price synchronicity for each stock share in our sample in each year and then include it in the following model to examine how much the stock price can

be interpreted by the synchronicity as a measure of the trader's behavior and property rights:

$$P_{it}^A = a_{0t}^A + a_{1t}^A \text{RSQ}_{it} + \xi_t^A \quad (5a)$$

$$P_{it}^B = a_{0t}^B + a_{1t}^B \text{RSQ}_{it} + \xi_t^B \quad (5b)$$

Where RSQ_{it} is stock i 's synchronicity in year t . The resulting ξ_t^A and ξ_t^B , representing the portion of the stock price that is unexplained by the synchronicity variable, are included as dependent variables in the following regressions to examine whether our primary results of R^2 are robust when the stock prices are adjusted with synchronicity:

$$\xi_{it}^A = a_{0t}^A + a_{1t}^A \text{BV}_{it} + a_{2t}^A E_{it} + e_t^A \quad (6a)$$

$$\xi_{it}^B = a_{0t}^B + a_{1t}^B \text{BV}_{it} + a_{2t}^B E_{it} + e_t^B \quad (6b)$$

The results (not reported in tables), again, indicate that B-share accounting information typically has higher value relevance than its A-share counterpart. While we find that the price synchronicity plays a certain role in explaining the stock price, it does not eliminate the role of accounting information as manifested in the t -statistics and R^2 in models (6a) and (6b), indicating that our primary results are attributable to the difference in accounting information.

4.5. Other sensitivity tests

Early research documented that the value relevance of earnings (earnings response coefficient) can be influenced by factors such as firm size (Collins et al., 1997; Collins & Kothari, 1989), systematic risk (Collins & Kothari, 1989), economic growth (Beaver & Ryan, 2000; Lee & Sami, 1998), trading volume (Eichenseher, 2000), and privatization degree (Ali & Hwang, 2000).²² To further analyze the impact of those

²² Audit opinion might also be an omitted variable in this study. To investigate whether audit opinion affects the reported results, we estimate a model including both the intercept term and interactive term of a dummy variable for audit opinion which is coded as one if a company received an unqualified opinion with explanatory notes, a qualified opinion, or disclaimer of opinion. Audit-report information is hand-collected from annual reports published on <http://www.stock2000.com.cn> and China Securities Information Library 1999 (provided by <http://www.jetch.com.cn>). The results of BV and E for A-share observations (305 observations) remain the same qualitatively. No significant results are found for terms with dummy variables of audit opinions. Besides, the F -statistics are weaker for the model with audit opinion as control variables. For B-shares, no estimates are made due to the availability of data. For a sample of 12 firms (30 observations), all the audit opinions are unqualified except for one firm (two observations) in which the auditor issued no opinion. The insignificant results might be attributed to the difference between the price model and the return model. The price model evaluates a firm's value based on annual accounting information rather than the market reaction to the disclosure of audit opinion in a short-term event window as in Chen, Su, and Zhao (2000).

factors on the value relevance of accounting information in the Chinese emerging market, as well as the difference between their impacts on A-shares and B-shares, we form portfolios based on the magnitude of the control variables and conduct separate analyses for each portfolio.²³ The results are mostly consistent with the predicted effect of the control variables. More importantly, B-share portfolios have accounting information, especially earnings information, more relevant to market prices than their counterparts in the A-share market, as suggested by the coefficients and adjusted R^2 . This further supports Hypothesis 1b.

For firms with negative earnings, the increased frequency of negative earnings in later years could contribute to the temporal decline in the incremental value relevance of earnings. For instance, early studies document that firms reporting negative earnings have smaller earnings response coefficients than those reporting positive earnings (Barth et al., 1998; Collins et al., 1997). To investigate whether the changes in value relevance is due to some noises caused by firms reporting negative earnings, we performed the test using companies with positive earnings and the results are qualitatively the same.

In this study, we obtain the data for all companies issuing both A- and B-shares during the research period. To check whether the results on changes in value relevance over time are caused by the different composition of the sample over time, we use a fixed sample of companies issuing both A and B shares, which include 38 companies and 266 observations. The results are qualitatively the same. Also, to check the externality of the research, we examine a fixed sample of companies issuing all A-shares (51 companies and 357 observations) and the results of time-series changes in A-shares' value relevance are also qualitatively the same.

Kothari and Zimmerman (1995) indicate that the price models are more likely to generate unbiased coefficients than return models. However, their study also suggests using both return models and price models to make the results more robust, because return models have less econometric-specification problems. Therefore, we also estimate the results based on the return model, in addition to the price model. As reported in this paper, the results of B-shares are more robust than A-shares and R^2 for the middle years are relatively higher than earlier years and later years for A-shares as reported in the price model.

In addition, the literature also suggests that the price model is sensitive to the deflator used (e.g., Brown et al., 1999; Kothari & Zimmerman, 1995). In this paper, we deflate the independent variables by total number of outstanding shares. To check the robustness of the results, we also try book value of equity as an alternative deflator. The adjusted R^2 for the book-value-deflated price model are generally much higher than those of the total-share-deflated price model and qualitatively support our hypotheses.

²³ In addition, to consider the simultaneous effect of these factors, we estimate a regression model with dummy variables for these factors and their interaction terms with book value and net income. The results are qualitatively the same.

5. Conclusions

Overall, the results indicate that accounting information is relevant to prices in both the A-share and B-share markets. Furthermore, the results show that the value relevance of accounting information is different between the two markets. The accounting information in the B-share market is more value relevant, as expected. Also, we find that in the A-share market, the relevance level of accounting information to the market price was low in early years, peaked in 1996, and then decreased in the last 2 years.

The limited time-series results are inconsistent with the recent movement in China's regulatory environment, which could be explained by one or any combination of the following: (1) China's regulations in most recent years may not empirically impact the value relevance of accounting information although theoretically it should be; (2) China's regulations in recent years may not immediately impact the value relevance of accounting information—the time-series observation is only 7 years; in addition, the issuance and implementation of new auditing and accounting standards during the period of 1996–1999 might imply that the A-share investors need more time to become familiar with the new accounting information and use it properly; (3) China's regulations in recent years may not dominantly impact the value relevance of accounting information—as discussed in Ryan and Zarowin (2003), the value relevance may decline because earnings increasingly reflect news with a lag relative to stock prices and also earnings increasingly reflect good news and bad news asymmetrically. Future studies could investigate the third possibility to examine the different factors in explaining the declining value relevance of major accounting information over time.

We addressed some of the differences between our study and the prior research in the introduction. In our paper, we do not investigate the information content of reconciliation (which is done by Haw et al., 1999), nor the earnings conservatism (which is done by Ball et al., 2000), nor the comparison of value relevance between different sets of accounting information for the same companies in the same market segment (as Bao & Chow, 1999) or between companies with different ownership structures in the same market segment (as Chen et al., 2001). We simply compare the value relevance of accounting information between the two different market segments. Thus, our conclusions could be different from these studies due to different perspectives (different research issues). Our paper is not the only one to reach such a conclusion. For instance, the same conclusion is also drawn in Chen et al. (2003).

The findings of our study have several implications for a variety of users. First, it provides both foreign and domestic investors with useful information regarding the relevance of the firm's accounting performance to its market value. Because in the emerging markets accounting data may be considered noisy due to sloppy accounting, inadequate regulation, and crony capitalism, it is not clear whether financial statement-users rely on accounting information in making their decisions. This study adds to the body of the evidence that accounting information is relevant to the pricing process in both the A-share and B-share markets.

Second, for policymakers, the value-relevance information may indicate a direction for policy-making. For instance, the cross-sectional comparison of accounting information prepared under local GAAP and the IAS has implications for recent moves toward replacing the local GAAP with the IAS.

In our study, we identified firms that issued both A- and B-shares on either the Shanghai Stock Exchange or the Shenzhen Stock Exchange. The sample of A-shares in this study might not be generalized to the whole population of firms that issued A-shares on Chinese stock exchanges.²⁴ Due to the dual reporting and auditing systems, as well as better corporate governance, companies with both A- and B-shares might reflect a higher quality in their financial reporting, and thus their accounting information could be more value relevant to pricing in the market. To shed light on the general value relevance of accounting information in the A-share market, future studies could compare the value relevance of accounting information for firms that have only A-shares and firms that have both A- and B-shares and address the reasons underlying the differences in value relevance.²⁵

Finally, this study only takes a value-relevance approach to investigate the association between accounting information and stock price, rather than an information approach. Future studies could examine how much accounting information contributes incrementally to equity value in these markets, by testing the price movements during short windows surrounding the release of accounting information.²⁶

Acknowledgements

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²⁴ The major purpose of this study is to compare the value relevance of accounting information prepared and audited under two different accounting standards. To control for the effects of firm-specific factors, the sample is identified as those companies that issue both A- and B-shares. If a company only issues A-shares, it does not have to reconcile with IAS, so these firms are excluded from the study. Nevertheless, we investigated all firms that issue A-shares as a sensitivity test. The results qualitatively remain the same. These A-share groups have substantially lower coefficients, t-statistics, and adjusted R-squares than B-share groups. The level of value relevance is also generally similar to those reported in the paper, which adds support for the results of our matched samples.

²⁵ Chen et al. (2001) investigate this issue in their sensitivity test. They find that accounting information under Chinese GAAP was more value relevant for firms issuing only A-shares than for firms issuing both A- and B-shares. They explain that the latter have more alternative sources of information other than financial reporting in comparison to A-share only companies. This may imply difficulties in simply generalizing the results of A-share sample in our study to the A-share market. However, we also find in our study that the adjusted R-square and the coefficient of A-share earnings peak in 1996, the same pattern as that of the A-share sample in Chen et al. (2001).

²⁶ For an example of these event studies, see Ball and Brown (1968).

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Book Review Section

The book review section is interested in works published in any language, as long as they are comparative or international in character. The author or publisher of such works should furnish the book review editor with two (2) copies of the work, including information about its price and the address where readers may write for copies. Reviews will be assigned by the book review editor. No unsolicited reviews will be accepted. Suggestions of works that might be reviewed are welcomed.

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Book reviews

W.R. Scott, *Financial Accounting Theory*, Third ed., Pearson Education Canada Inc., 2003.

Bill Scott, *Financial Accounting Theory* has been recognized as one of the best textbooks on accounting theory since the first edition was published in 1997. The book steps back from the usual discourse about the standard-setting process, and places accounting in its environment. The main topics facing accounting research for the last 40 years are discussed in the different chapters.

What is accounting theory? Few textbooks in accounting theory provide a straightforward answer to this question. And, when they do, the answer is often related only to accounting. Scott, however, defines the *fundamental problems* (p. 8) of accounting theory as the provision of different relevant information for both internal and external users. For external users, the principal purpose of the information provided is to reduce adverse selection while for internal users the goals are to motivate managers and avoid moral hazard. His definition, based on a situation of fundamental information asymmetry, offers a substantial improvement over past definitions expressed clearly or implicitly.

Zeffer and Keller (1987) discuss in detail the standard-setting process and the constitution of a conceptual framework that is, for them, the basis of accounting theory. Their book reprints some of the most important articles written in accounting in the last 40 years. Underdown and Taylor (1985) classical book of accounting theory discusses standard setting, accounting measurement, and the disclosure of many different accounts. It is clear that their definition of accounting theory: "... to provide a framework for (1) evaluating current financial accounting practice and (2) developing new practice," cannot apply anywhere outside the accounting domain. Wolk et al., 1992 propose another "standard setting" definition of the accounting theory, while, in the same spirit, Kam (1990) writes a definition that had been contested by Watts and Zimmerman: "A comprehensive theory of accounting should provide rules for recognizing certain relevant economic objects and also provide a basis for judging whether a given practice is 'good' or 'bad.'" Most (1982) confounds the conceptual framework, establishing the objectives of accounting, with the theory itself: "... at the present time there is an unmistakable drive toward the formulation of an accounting theory, often referred to as a conceptual framework." Belkaoui (1992) definition seems to enter the modern era: "The primary objective of an accounting theory is to provide a basis for the prediction and explanation of accounting behavior and events." Mathews and Perera (1996) also have some problems with the concept of accounting theory. Their epistemological discussion of the question in chapter

four seems to have universal acceptance, but in chapter five, when they try to apply this to accounting, they change the meaning of the words: "There is a definite link between accounting theory and accounting practice, in the sense that accounting theory construction stems from the need to provide a rationale for what accountants do or expect to be doing." Finally, Christensen and Demski (2003) are, after Scott, the first to propose and apply a really coherent definition of accounting theory: "The short answer is that we want to study, to illuminate, the choice of accounting method. Our focus is on the choice, not how to do the accounting per se (...). (...). This leads us to use economic theory, in particular the economic theory of choice under uncertainty, as the workhouse in studying this accounting choice."

With Scott's book, accounting theory enters a new era. The basis of accounting becomes an object of research and his discourse is theoretical. Since accounting is supposed to provide information for decision making, the theory of accounting is firstly a theory of decision.

Description of the content. After introducing the topic and establishing the theoretical basis of the approaching chapter two provides a discussion of information under certainty and uncertainty. Chapter three discusses the usefulness of decisions in economic terms. Since these decisions are about investment in the market, Scott then discusses the efficiency of security markets and includes a section on the *Social significance of properly working securities markets*. Unfortunately, this section, based implicitly on the Walrasian notion of equilibrium, presents an efficient market with reasonable information as a possibility although none has ever been observed in the real world. Accounting research had been driven by the notion of market efficiency for decades. This book provides a very relevant survey of the economic, informational, and financial implications of the provision of financial information. There is also a chapter on measurement, which does not belong to accounting theory, per se. It is brought into the debate, however, to demonstrate the great need for information to be accurate if it is to be useful for the market. From this perspective, measurement becomes relevant for theory as an object of research.

Next, the positive accounting theory is introduced and its economic and financial origins are described at length. Its positivist origins, however, are totally ignored. There is no mention of Comte as a possible epistemological source of the theory. The ties between positive accounting and positive economics through the Rochester School are also totally ignored. In this presentation, the positive theory results from adding one hypothesis (the political cost) to agency theory and it can be added in a contractual-political paradigm. Although this view obliterates at least half the message contained in the positivist position, it is widespread in accounting research.

The next section reviews subsidiary topics. For example, the author underlines how executive compensation has been revolutionized by agency theory. The question of earnings management is also scrutinized, although there is no serious discussion of the effect of such a practice on the efficiency of the market. A discussion of this topic is also missing in the literature. To ignore the relationship between earnings management and market efficiency can be intellectually risky. After the Enron affair, we can hardly deny that there are some effects, and they seem to constitute a negation of market efficiency.

Finally, the book discusses the standard-setting question against an economic background. However, the question of standard setting as a market failure is discussed only slightly as are transformations of the theory by notions such as Simon's bounded rationality or Stiglitz's asymmetry of information. To ignore this topic is like saying that accounting theory never evolves and that the basic notions had not been modified since Jensen and Meckling (1976) or Watts and Zimmerman (1978). Even the most blind and stubborn researcher in finance can no longer seriously contend that markets are efficient. But, in accounting research it continues to be done explicitly or implicitly. If the possibility of inefficiency is discussed, it is through the question of anomalies and is rapidly discarded in favor of the notion of imperfectly efficient markets.

The question and problems at the end of the chapters are more practical than in many other textbooks. Students have to prepare statements under specific conditions, calculate probabilities, adjust utility functions, or calculate Beta. There are also questions that are more traditional in accounting theory, as well as more original questions about important pieces of research.

New edition. I compared the third edition with the first. The changes are not very major, in part because the first edition was published in 1997, not very long ago. The most important change is in regard to measurement. In the first edition there was a long chapter on measurement and a relatively short one on the economic consequences of accounting standards. In the new version, the topic of measurement situated in two chapters and the discussion of economic consequences has been shortened and presented together with positive accounting theory. The content of the book has not really changed appreciably since the first edition. But, that edition constituted a radical improvement in financial accounting theory textbooks.

In substance. The book flows well and although it is research oriented, there are practical examples to illustrate various points that should make them easy for students to grasp when they do the work at the end of the chapter.

If I had to pick a book to use to teach an undergraduate accounting theory course, it would be this one, which I think this is actually the best on the market, by far. It can also be used in many master-level courses as a main or subsidiary reference, as intended by the author. Although there is no mention of the international context, where accounting is supposed to inform the participants about the stock market, the topics covered are mostly relevant.

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A. Pierce, N. Brenman, *Principles and Practice of Group Accounts: A European perspective*, Thomson Learning, London, 2003 (XX+564 pp.).

For most large companies, consolidated financial statements are the preferred channels of financial communication with investors. Textbooks on consolidation, group accounts, or business combinations consequently are important. This textbook deals with consolidation, so it is highly relevant, and because it has a European focus, it is especially welcome. Few accounting textbooks cover accounting practices in different European countries, and those that do focus on specific accounting regulations in just one European country. The books that go beyond a specific institutional environment generally discuss the entire domain of financial accounting, devoting only one or two chapters to consolidation.

This book will be especially welcomed by European accounting academics. In European universities, curricula for accounting degrees often include separate courses on consolidation. In many continental European countries, there is a significant difference between single-entity accounts and group accounts. The single-entity accounts often serve as the basis for tax declaration, resulting in distortions of accounting figures for tax reasons. Although fiscal consolidation is the rule in some countries, other countries require that consolidated financial statements be corrected for tax-driven entries in the underlying single-entity statements.

The decision of the European Commission to require the use of International Financial Reporting Standards for the consolidated financial statements of listed companies from 2005 onwards will lead to the adaptation of local accounting laws and regulations. It is hoped that the increased comparability of financial statements of listed companies will have a positive effect on the European financial markets. In light of this development, this book has a significant market potential. Although it begins with the U.K. and Irish accounting regulations, it later emphasizes IAS/IFRS GAAP.

The regulatory frameworks are discussed in the fourth part of the book. The preceding chapters deal with the mechanics of preparing consolidated financial statements. The book

adopts a rather technical perspective on consolidation. This makes it more suitable for use in programs that focus on accounting, rather than broad-based programs which offer only one course on financial reporting, such as typical MBA programs.

The book is also quite useful for self-study purposes. For each chapter, learning objectives are briefly defined. There are multiple-choice questions, self-assessment exercises, and examination-style questions. Solutions to the multiple-choice questions are at the end of the book; solutions to self-assessment exercises can be found on the textbook's website, where lecturers can also access the examination-style questions.

All chapters include worked-out examples. The numerous quotes from the financial statements of the largest European companies give a touch of "real life" to the book.

The first part of the book is introductory in nature. It highlights the objectives of consolidated financial statements and introduces the major types of business combinations and group accounting methods.

The second part of the book focuses on the consolidated balance sheet. Starting from the basic working accounts, it moves to consolidation adjustments and intragroup dividends. All major items are illustrated with numerical examples, including journal entries. The chapters move from the simple to the more complicated, such as acquisitions during the accounting period, changes in percentages of acquired shares, and complex group structures with indirect holdings. One chapter discusses equity-method accounting, and another chapter deals with merger- or pooling-of-interests accounting.

In the third part, the consolidated profit-and-loss account is analyzed. Two chapters deal with its preparation and the impact of equity accounting, respectively. A third chapter discusses the disposal of shares in subsidiaries. Again, numerous worked-out examples allow the reader to check for her- or himself whether the content of the chapter is mastered.

The regulation of consolidation is the subject of the fourth part. This starts with an introduction to European, U.K., and international regulations. The chapter includes a comparative table of the differences between U.K. GAAP and IAS GAAP (pp. 241–242). It is based on the 2000 PricewaterhouseCoopers' study of the differences between IAS, U.S., and U.K. GAAP. Similar publications by PwC and other accounting firms are available for other European countries, so it should not be too difficult for adopters of the book in other countries to prepare a similar table that is relevant for their country. The discussion of the regulatory framework then distinguishes parent and subsidiary undertakings from associated undertakings and joint ventures. In these chapters, the discussion of U.K. GAAP is more detailed than the analysis of IAS GAAP. The international sections not only look at the international accounting standard, but also the SICs. This part of the book concludes with chapters on the regulation of acquisition and merger accounting and on goodwill.

Finally, the fifth part includes specific topics such as foreign-currency transactions, consolidated cash-flow statements, off-balance-sheet finance, and segmental reporting.

The Irish background of the authors probably explains why some topics that generally are prominently discussed in continental European textbooks are more or less absent from this book. A typical example is the analysis of deferred taxation.

As the book was published in 2003, it is based on accounting regulations as of December 2002. Things are changing fast, however, especially in the area of IASB standards. The book refers to IAS 22 and 27. However, IAS 27, on consolidated financial

statements, underwent a number of changes at the end of 2003, and IFRS 3 replaced IAS 22 on business combinations. Consequently, part of what is written in the book is no longer valid. A few examples can illustrate the significance of the changes. The standards now reject pooling of interests, and purchase accounting remains the only acceptable method of accounting for business combinations. Goodwill can no longer be amortized but should be recognised at cost minus any accumulated impairment losses. In IAS 27, the number of allowed alternatives to account for subsidiaries in consolidated financial statements and to account for investments in the separate financial statements of a parent, venturer, or investor was reduced.

These changes in regulation call for a new edition of this textbook. A textbook based on the current version of accounting standards would be welcomed by lecturers in Europe who teach consolidation. The numerous worked-out examples, the self-study materials, and the examples taken from real financial statements will be strongly appreciated. If such a new edition would be considered, my suggestion would be to reduce the number of pages devoted to U.K./Irish accounting. Currently, Chapters 14 and 15, dealing with company legislation and professional accounting regulations, spend 34 pages on U.K./Irish accounting regulations against only 25 pages on international accounting standards. Obviously, non-U.K./Irish adopters will be less interested in the U.K./Irish part. Given the decision on the European level, most likely, these standards will also gradually become less important in a U.K. and Irish context. More pages could then be devoted to an analysis and discussion of some of the more complex issues in group accounting. Obviously, not very much should be changed in the first parts of the book, as these are rather independent of framework.

Ignace De Beelde
Ghent University, Ghent, Belgium

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
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
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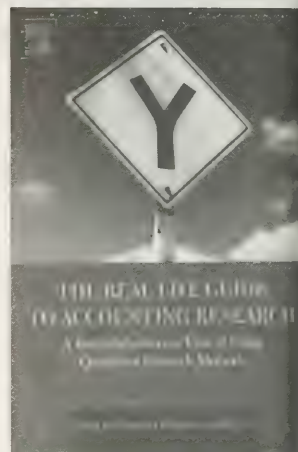
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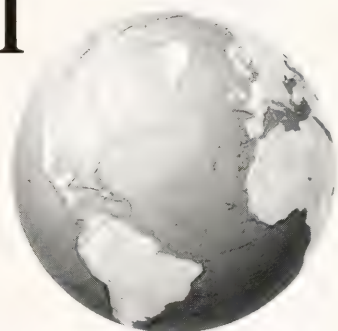
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The financial performance, capital constraints and information environment of cross-listed firms: Evidence from Mexico[☆]

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Abstract

This study provides evidence that Mexican firms that choose to trade in the United States as exchange-listed American Depositary Receipts (ADRs) have significantly weaker ex-post (subsequent to cross-listing) financial performances than Mexican firms that are eligible to list in the United States but choose not to do so. Our study is related to the generalizability of two streams of international research: global equity offerings studies (e.g., (Errunza & Miller 2003; Foerster & Karolyi 2000) [Errunza, V. & Miller, D. 2003 Valuation effects of seasoned global equity offerings. *Journal of Banking and Finance* (September), 1611–1631; Foerster, S. & Karolyi, G., 2000. The Long-run performance of global equity offerings. *Journal of Financial and Quantitative Analysis* (December), 499–527]), based on large, multi-country samples, which show that ADR firms substantially underperform local-market benchmark company returns in years following issuance and accounting characteristics of ADR firms research (e.g., (Lang, Raedy, & Yetman, 2003) [Lang, M., Raedy, J. Smith, & Yetman, M. (2003). How representative are firms that are cross-listed in the United States? An analysis of accounting quality. *Journal of Accounting Research*]), which employ a multi-country sample and conclude that ADR firms are less aggressive in terms of earnings

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management and that they report accounting data that are more strongly associated with share prices. The cited studies above use relatively large samples, which are usually considered to be advantageous, but such studies tend to mask individual country differences in market efficiency, legal protections for shareholders, disclosure environment, and shareholder-class features that make generalizations tenuous.

We show that cross-listed (ADR) Mexican firms, on average, are smaller, more highly levered, and less profitable than non-cross-listed (NCL) firms. Further, logistic regression models for classifying various ADR and NCL groupings of firms, using financial variables and other firm characteristics, are highly significant. While supplemental tests of earnings quality suggest that NCL firms exhibit nominally smoother earnings, that evidence is not sufficient to explain the stronger financial performance reported for those firms relative to ADR firms. Finally, our tests of value relevance, using book value and earnings to explain price, show significantly higher explanatory power for the ADR firms and generally non-significant explanatory power for the NCL firms. The value-relevance results may indicate that investors in Mexican ADR firms benefit from U.S. regulation and that reported market inefficiency in Mexico may result in low demand for financial statements of NCL firms.

This study has the advantage of focusing on a single, emerging-market economy (Mexico, the United State's second-largest trade partner) in contrast to most previous ADR research that uses multi-country samples dominated by developed-market countries. It is also one of the first ADR studies to deal with selection-bias issues by comparing ADR and NCL firms. To gain these advantages, however, we must conduct tests on and draw conclusions from a relatively small sample.

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1. Introduction

This paper investigates whether there are systematic differences in the financial performance, capital structure, and quality of financial information for Mexican firms that choose to trade in the United States as American Depositary Receipts (ADRs) and Mexican firms that are eligible to trade in the United States, but do not. This question is especially important in light of recent research findings in Lang et al., (2003). Their results, based on samples from 21 countries (including both developed and emerging markets but not Mexico), indicate that cross-listed firms are less aggressive in terms of earnings management and that they report accounting data that are more strongly associated with share prices. The implication is that the quality of earnings is higher for cross-listed firms.

However, Foerster and Karolyi (2000) suggest that companies cross-listing on major U.S. exchanges from countries with significant investment barriers for foreigners underperform local benchmark market-return indices. Lins, Strickland, and Zenner (2000, 4) suggest that the law and the quality of its enforcement are likely to be important factors in determining the success of efforts to raise capital by firms from emerging markets that seek financing outside their home countries. Therefore, results based on multi-country studies may not apply to firms from emerging-market economies.

We consider the implications of the Lins et al. (2000) study for firms from an emerging market that cross-list in the United States by investigating firms from Mexico, the United States's second-largest trade partner and the emerging-market country with the largest number of firms cross-listed on U.S. exchanges. Mexico has unique institutional features, such as the use of segmented share classes to prevent foreign control of Mexican corporations, as well as other country- and firm-specific characteristics that may cause the type of cross-listed firm from Mexico to differ from those from other countries.

Our results indicate that, on average, Mexican cross-listed (ADR) firms are smaller, more highly levered, and less profitable than the non-cross-listed (NCL) firms. While supplemental tests of earnings quality suggest that NCL firms exhibit smoother earnings, this evidence does not explain the stronger financial performance reported for Mexican NCL firms since ADR firms also exhibit weaker operating cash flow performance. Finally, our tests of value relevance, using book value and earnings to explain price, show significantly higher explanatory power for the ADR firms and generally non-significant explanatory power for the NCL firms. The value-relevance results may indicate that investors in Mexican ADR firms benefit from U.S. regulation and that evidence of market inefficiency in Mexico (Bhattacharya, Daouk, Jorgenson, & Kehr, 2000) may result in low demand for financial statements of NCL firms. This study has the advantage of focusing on a single, emerging-market economy in contrast to most previous ADR research that uses multi-country samples dominated by developed-market countries. It is also one of the first studies to deal with selection-bias issues by comparing cross-listed and non-cross-listed firms. To gain these advantages, however, we base our tests on and draw conclusions from relatively small samples.

The rest of the paper is organized as follows. Section 2 provides additional justification for a single country—Mexico—cross-listing study. Section 3 reviews prior research and provides additional background information about the ways Mexican companies have accessed U.S. capital markets. Section 4 develops our hypotheses and describes the research methodology used to test the hypotheses. Section 5 describes our data sources, the composition of our samples, and presents the results of our analyses. Section 6 concludes the paper.

2. The importance of a single country focus: Mexico

Much of the previous ADR research evidence is based on test results drawn from large, multi-country samples (Amir, Harris, & Venuti, 1993; Lang et al., 2003; Rees & Elgers, 1997). However, LaPorta, Lopez-De-Silanes, Shleifer, and Vishny (1998) suggest that country-specific legal rules regarding the protection of shareholders and creditors, and the quality of enforcement of those rules, help define the rights that various securities afford their owners. These rights in turn determine whether or not firms can raise external capital (LaPorta et al., 1998, 1114). Therefore, country-specific legal rules may create different incentives for firms to seek financing outside their home countries and, as important, investors may respond differently to the efforts of firms from different countries to issue capital. These considerations bring into question the wisdom of generalizing from multi-country results, leading us to suggest the need for individual-country tests.

Because the environment for corporate-finance decisions in Mexico differs substantially from that in the United States, research in this area has the potential to yield rich results. First, the efficiency of the market is open to question based on recent evidence in Bhattacharya et al. (2000) that Mexican restrictions on insider trading have not been enforced. Second, as LaPorta et al. (1998) point out, Mexican accounting rules and investor protections are rooted in the civil-law tradition of France rather than in the common law tradition of the United States, and countries from the French civil-law family generally provide the worst legal protections to shareholders. Third, Mexican companies use inflation accounting in their domestic financial statements. Since they are not required to change the measurement model when reconciling to U.S. GAAP, they reduce one of the costs of cross-listing in the United States. Fourth, the Mexican environment provides a sharp contrast to the United States when considering the effects of ownership structure. As is the case for several other emerging-market countries, Mexican firms typically issue multiple classes of equity that differentiate between foreign and domestic investors.¹ For example, non-financial companies can issue Series A shares restricted to Mexican investors, granting full voting rights and collectively representing legal control with 51% or more of the voting shares. On the other hand, Series B shares are open to all investors, regardless of nationality, grant full voting rights, but cannot collectively represent legal control because they may not exceed 49% of the voting shares.² Domowitz, Glen, and Madhavan (1997) have documented significant price premia for Mexican shares not restricted to domestic investors. In another study, Domowitz, Glen, and Madhavan (1998), showed that in the Mexican domestic market, liquidity increases and volatility decreases after ADR cross-listing for those series of shares open to foreign ownership. An explanation for this might be a migration of foreign investors away from the domestic market, i.e., the order-flow migration. In addition, the observed, positive excess returns associated with ADR listing largely accrued to those same series of unrestricted shares open to foreign investors prior to cross-listing. This last result implies that the cost of capital benefits of cross-listing equity shares might be smaller than originally thought. It might well be that the peculiar characteristics of the Mexican share ownership, with private control held by a few Mexican investors, limit the benefits associated with the expanding ADR shareholder base, but this is a contention that deserves investigation.³ One alternative explanation for

¹ See Davis-Friday (2001) and Gordon (2001) for more information regarding Mexican financial reporting institutions.

² These unrestricted B shares are held in deposit as the equivalent of ADR securities listed and traded in foreign (U.S.A.) markets. For Mexican financial companies, Series C shares are similar to the B series described here, but they are limited to 30% of the total capital. In addition, though less frequently issued, there are Series O, L, and N, available to all investors but with limited or no shareholders' voting rights. Finally, in addition to these, though less frequently used, Mexican firms can issue CPOs (Certificates of Ordinary Participation) which are traded in the Mexican Bolsa and represent a cocktail of various series of a company's shares available in the market. These CPOs have features similar to stock warrants and are exchangeable for the shares that the CPO package combination represents.

³ This relates to corporate governance and minority shareholders rights, issues that have attracted attention, especially when related to firms with globally diverse shareholders (Foerster & Karolyi 2000; LaPorta, Lopez-De-Silanes, Shleifer & Vishny 1999).

abnormal returns to the unrestricted Mexican B shares prior to cross-listing is that investors (either national or foreign) foresaw the option of added dollar liquidity for those equivalent shares in a developed foreign market. Likewise, the tax benefits of these B shares in the Mexican market, where neither capital gains nor dividends are taxable income for individual investors, constitute another enticement for investors, a benefit that would certainly dissipate when those gains or dividends were cashed in foreign (USA) security exchanges.

These market efficiency, legal, disclosure, and shareholder-class features, coupled with Mexico's traditionally heavier reliance on banking institutions as opposed to capital markets as a source of capital, as well as a tendency for companies to be closely held, may make Mexican firms significantly different from U.S. firms and firms cross-listed from other countries.

Finally, the focus on Mexico is important due to the growth of Mexico as a U.S. trading partner. In 1998, Mexico surpassed Japan as the United States's second largest trading partner (Canada is the largest).⁴ Furthermore, over the past decade, there has been a sizable amount of trading of Latin American securities within U.S. markets as well as capital issuance using ADR and Rule 144a listings. For example, in 1995, 10 (six) of the 25 most actively traded foreign stocks in the United States in terms of share volume (dollar volume) were issued by companies domiciled in Mexico, Brazil, Argentina, and Chile.⁵ Currently, of the 458 non-U.S. companies listed on the NYSE, 95 are from Latin America and 26 are from Mexico.⁶ Thus, a focus on Mexico is important in its own right.

3. Background and prior research

3.1. Accessing U.S. capital markets

Most non-U.S. exchange-listed companies trade in the form of American Depositary Receipts (ADRs). ADRs are dollar-denominated derivative instruments. A depositary bank (primarily the Bank of New York in the case of Mexico) obtains claims on foreign securities and issues dollar-denominated claims against them. The ADRs pay U.S. dollar dividends and are processed through the U.S. clearance and settlement system.⁷ A

⁴ See *Migration Policy Institute*, "US-Canada-Mexico Fact Sheet on Trade and Migration," 2002, at www.migrationpolicy.org.

⁵ See Cochrane, Shapiro, and Tobin (1996) for this and additional evidence concerning the internationalization of U.S. investment.

⁶ NYSE website, www.NYSE.com, statistics as of November 2001.

⁷ Pulatkonak and Sofianos (1999) note that NYSE-listed non-U.S. companies trade in several forms including ADRs, Global Depositary Receipts, home-market "ordinaries" in the case of Canada, and New York Registered Shares. The instruments differ in the degree of fungibility with the corresponding home-market securities. For instance, Canadian ordinaries are fully fungible because a trade made in the United States will be denominated in U.S. dollars while the same trade made in Canada would be denominated in Canadian dollars.

company that wishes to list and trade securities in the secondary market will choose either Level 1 or Level 2 ADRs. The advantages of the Level 2 listing are the availability of price quotes and the greater visibility associated with exchange listing. The primary disadvantage is the need to meet U.S. disclosure requirements, including reconciliation to U.S. GAAP.

In order to raise new capital in the United States, the non-U.S. company must choose a Level 3 ADR and meet the standard SEC requirements for issuing securities, such as issuing an F-1 Registration Statement, providing annual 20-F filings, and reconciling financial statements to U.S. GAAP, or choose a semi-private offering via Rule 144a. Rule 144a allows privately placed securities to be sold to *qualified institutional buyers* (e.g., large insurance companies, banks, and investment companies). Such sales are exempt from SEC registration requirements. However, such issuers must provide buyers with information about the nature of the business and recent audited financial statements, generally prepared under home country GAAP. Furthermore, Rule 144a offerings are restricted to smaller companies since registration with the SEC is generally required if the assets of the foreign issuer exceed US\$10 million or if it has 500 or more equity holders. We investigate firms that have chosen to raise capital across all of these dimensions as well as firms that are eligible to trade on U.S. exchanges, but have not cross-listed.

3.2. Evidence regarding cross-listing

Saudagaran (1988, 1990) argues that the potential benefits of foreign listing relate to financial, marketing, political, and employee-motivation considerations. The primary financial considerations are access to larger capital markets, reduced dependence on domestic sources of capital, avoidance of a decline in stock prices due to saturation of domestic markets, access to foreign capital to finance foreign expansion, and the opportunity to meet operating and long-term debt obligations abroad. Market considerations relate to greater visibility and product identification abroad and enhanced corporate image. Political considerations include improved international relations and employee motivation considerations include improved labor relations and the use of stock in employee compensation plans abroad.

Baker, Nofsinger, and Weaver (1999) investigate changes in visibility associated with cross-listing, using analyst coverage and media attention as proxies. Their results from analyzing changes in analyst coverage are consistent with the “investor-recognition” hypothesis of Merton (1987), which indicates that an increase in the size of the investment base lowers expected return, lowers the cost of capital, and increases the market value of shares.

We do not explore visibility issues in this paper, but instead focus on access to capital as the primary firm benefit from cross-listing in the United States. Limited access to external capital is a primary motive for foreign listing in Bruner, Chaplinsky, and Ramchand (1999); Miller (1999); and Stulz (1999). Later, we provide evidence of substantial raising of capital for our exchange-listed ADR firm sample.

Lins et al. (2000) empirically investigate whether cross-listing in the United States reduces the costs of market segmentation by improving access to capital.⁸ Using an ADR sample covering the period 1986–1996 and data from *Worldscope*, the authors document that the sensitivity of investment to cash flow decreases significantly for firms from emerging markets but does not change for firms from developed markets following cross-listing and that firms access international capital markets more often following cross-listing. They suggest that this may be the case because emerging markets are often segmented. Market segmentation may arise from direct (e.g., ownership restrictions) and indirect (e.g., information production, accounting standards) barriers. These barriers impede the flow and formation of capital in non-U.S. markets (Lins et al., 2000, 1). Lins et al. (2000, 2) argue that relative to their home markets, greater disclosure requirements, shareholders' rights protection, liquidity, and analyst following reduce the information asymmetry for non-U.S. firms listed on U.S. equity markets, especially those from emerging markets.

4. Research design and hypothesis development

We develop and test three hypotheses based on the results from previous research. First, the major motivation for cross-listing is to reduce capital constraints. Second, the firms that are capital constrained and cross-listed are financially weaker than those that do not cross-list. Finally, because of the lack of enforcement of insider trading regulations in Mexico, Mexican ADR firms' share prices will be more associated with their accounting information as a result of the additional U.S. regulation.

4.1. Financial characteristics of ADR firms

Prior research does not compare the financial performance of Mexican cross-listed companies with eligible companies who have not cross-listed, so we instead rely on the results of prior global equity offerings research to suggest a directional hypothesis.

Consistent with the Lins et al. (2000) idea that foreign companies issue equity on U.S. exchanges to relax capital constraints, we expect our ADR firms to exhibit higher financial leverage than the benchmark NCL firms. The need for external financing may be especially great for certain firms from Mexico because of the nature of the Mexican debt market and the condition of the Mexican equity market during our sample period. LaPorta, Lopez-de-Silanes, and Zamarripa (2002) report that related lending, where banks lend to firms controlled by the bank's owners, is prevalent in Mexico and it takes place on better

⁸ We borrow the following quote from Lins et al. (2000) because it is so relevant for our study: "Stock markets from Mexico City to Sao Paulo have sunk in importance recently with trading shifting to Latin stocks listed in New York as American Depositary Receipts, or ADRs. . . The focus abroad means the only Latin American companies that can raise financing nowadays are those that have access to international markets. Thousands of small and medium-sized businesses—the bulk of Latin America's productive capacity—are left behind." ("Latin American Stock Trading Migrates North," *Wall Street Journal*, October 27, 1999).

terms than borrowing from non-related parties.⁹ The majority of the lending in Mexico during our sample period occurred between banks that were acquired by local families (during the privatization of Mexican banks that ended in 1992) who already controlled industrial groups and therefore had the financial resources to acquire the newly privatized banks (LaPorta et al., 2002, 14). This would suggest that the majority of related lending, and therefore favorable debt financing, occurred between closely (family) held industrial firms and their related banks. Because all firms were affected by the 1995 peso devaluation that led to significant decreases in equity market values, the most capital-constrained Mexican firms (i.e., those without related banks) would have to seek debt or equity financing outside Mexico. Whether or not these firms are successful in loosening capital constraints subsequent to ADR-listing depends on post-ADR-listing performance. While we do not posit a reduction in financial leverage subsequent to ADR-listing, we do provide evidence for a small sample of firms for which we have data. Our first hypothesis describes our expectations regarding the need for capital. It is stated in the alternative form:

H1. ADR firms are more capital-constrained (i.e., are larger relative to the domestic market and have more leverage) than NCL firms.

Errunza and Miller (2003) empirically test the impact of first time ADR firm listings on the cost of equity capital for the firm. The authors suggest that the effect on the cost of capital is the most important benefit of international cross-listing. Their research uses a modified event study methodology where a sample of 126 first-listed ADR firms are compared to a portfolio of matched non-ADR firms of the same size from their country of origin that are traded in their respective domestic market. The sampled firms are those selected from among foreign companies that entered the U.S. market as ADR issues during the 10-year period 1985–1994. The firms included in the sample represent Levels 1, 2 and 3 ADRs and also Rule 144A firms. To test the impact of cross-listing on the cost of capital of the firm, the authors use realized monthly buy and hold returns over 30 months prior to and 30 months after the year when the announcement of the ADR placement occurred.

The cumulative average returns for the portfolio of the 126 ADR firms for –36 to –7 months before the cross-listing announcement and +7 to +36 months after the same announcement were compared against the returns of the matched firm benchmarking portfolio for the same pre- and post-announcement time windows. The differences of stock returns between the ADR stocks and those of the matched non-ADR firms for the periods of analysis provided the measure of cumulative excess returns for the ADR sample firms.

The results of the statistical tests demonstrated a significant decrease in the cumulative returns (16.8% per year) for the ADR firms from their pre-announcement to the post-announcement periods. Likewise, there was an observed decline in their cumulative excess returns from the pre-announcement to the post-announcement windows of 11.3% per year. All this was indicative of a significant (42%) reduction in the cost of capital brought about by the introduction of the ADRs in the U.S. capital market. Contrary to previous research,

⁹ LaPorta et al. (2002, 3) indicate that the banking structure in Mexico is common in many developing countries.

Errunza and Miller (2003) did not detect excess performance of the cross-listed firms in the post-announcement period. The cumulative excess return during this post-announcement period was insignificant and negative (-1.04% per year), a result that was consistent with asset-pricing models under barriers to capital flows that predict companies earn a normal rate of return after their liberalization (cross-listing). As a consequence of the reduction in the cost of capital experienced by the newly cross-listed firms, there was a corresponding revaluation effect experienced by the sample firms prior to and including the announcement month that decreased dramatically in the post-announcement period.

Overall, our results support the hypothesis that financial market liberalizations (in this case represented by the cross-listing of foreign shares that reduces capital market segmentation) have significant economic benefits.

The Foerster and Karolyi (2000) results suggest that ADR financial performance declines subsequent to ADR issuance. Their results are consistent with the documented results for domestic equity offerings (e.g., Loughran & Ritter, 1995; Ritter, 1991; Spiess & Affleck-Graves, 1995). Foerster and Karolyi (2000) also investigate regional differences in their overall results, and after separating the returns for private and public issues, they show that the key driver of poor performance in Latin America is the public-issues program. Segmenting their sample into developed- and emerging-market groups, global-equity offerings for developed markets outperform emerging markets for all horizons and benchmarks. No specific country results were reported. In another test of the market-segmentation hypothesis and its implications for the cost of capital, Errunza and Miller (2003) identify a significant decline in returns (i.e., decrease in investment risk and corresponding decrease in the cost of capital) for a set of firms after their stock cross-listings. Using a sample of 127 firms (101 ADRs and 26 Rule 144-A issuers) from 32 countries, they find a 42% reduction in their annualized excess returns between the pre-announcement period (26.8%) to the time of placing their securities (15.45%) in the U.S. market. After cross-listing, the stock returns of the firms in their sample decreased substantially.

Based on both the domestic and global-equity-offering literature, we expect weaker financial performance after cross-listing for our Mexican ADR population relative to Mexican NCL firms (benchmark). We also attempt to analyze before- and after-cross-listing performance for a small sample of ADR issuers for which we have sufficient data. Again, based on prior literature, we expect to observe weaker financial performance after cross-listing for these firms and this is the basis for our second hypothesis stated in the alternative form:

H2. ADR firms exhibit weaker financial performance relative to NCL firms and relative to their own performance prior to cross-listing.

4.2. Information environment and the value relevance of accounting information

The cost of greater transparency has the potential to be a more binding constraint on cross-listing for Mexican firms than out-of-pocket costs. In a series of papers, LaPorta et al. (1998, 1999) show that the observed prevalence of widely held corporations in the United States does not hold as a pattern throughout the world and that widespread corporate ownership, where it does exist, is consistent with strong legal protection for

minority shareholders. LaPorta et al. (1999) analyze the ownership of the top 20 market-capitalization firms in each of 27 countries, including Mexico. Ownership-structure information is not available for non-cross-listed Mexican companies, so they focus on the 20 largest ADR firms. All are classified as “family owned” by the authors.¹⁰ Thus, even though privacy concerns exist as a potential constraint on cross-listing since Mexico has one of the highest incidences of family ownership, the majority of eligible Mexican firms has cross-listed in the US.

In two papers focused on Mexico, Domowitz et al. (1997, 1998) explore the effects of ownership restrictions and cross-listing on stock prices and market liquidity. Their share-price analysis of 24 equity issues on a daily basis and 46 equity issues on a weekly basis for 21 firms over the 1990–1993 period indicates significant price premia for shares held by foreign investors (B shares). They also examine the impact on the Mexican stock exchange (BMV) around the time of ADR issuance and present strong evidence of increased volatility and weak evidence of reduced liquidity (stronger evidence of reduced liquidity for B shares). In examining the impact of ADR listing on bid–ask spreads, they observe decreased spreads in the majority of cases.

Additionally, Mexican firms are more likely to benefit from cross-listing than are firms from many other countries because of time-zone considerations. Pulatkonak and Sofianos (1999) indicate that the six countries with the greatest U.S. market share are all within one time zone of New York and that 68.7% of the trading of Mexican cross-listed firms occurs in the United States. The importance of time zone relates primarily to trading-session overlap facilitating arbitrage trading, simultaneous security pricing in the U.S. and home markets, and the ability to disseminate new information during business hours.

Finally, in their tests of the efficiency of the Mexican stock market, Bhattacharya et al. (2000) note that in spite of laws against insider trading, there has never been an indictment, trial, or conviction for insider trading by the Mexican equivalent of the SEC. Their examination of daily price reactions to corporate news announcements for a sample of Mexican A and B shares over the period July 1994–June 1997 shows no difference in returns, volatility, trading volume, or bid–ask spreads for event and non-event periods. They provide further evidence that the return volatility of A shares leads the return volatility of B shares (consistent with insider trading), but not strongly enough for trading rules to arbitrage it away.

These issues relate directly to the results in Lins et al. (2000). Their results demonstrate that U.S. listing reduces the indirect costs of market segmentation by improving access to capital, especially for emerging-market firms. In the case of Mexico, ADR shares traded in the United States may represent underlying B shares or A shares (those previously restricted to ownership by Mexican nationals). Therefore, the cross-listing reduces market segmentation and potentially improves the informational efficiency of the cross-listed share prices. Thus, a potential benefit of cross-listing for investors in Mexican securities may be improved market efficiency resulting from U.S. regulation.

Much of the prior research related to the SEC disclosure debate has focused on the value relevance of GAAP reconciliations. Amir et al. (1993) examine the value relevance

¹⁰ We verified the high incidence of family ownership of Mexican firms by referencing a sample of 20-F registration statements available to us.

of both the aggregate reconciliations of earnings and shareholders' equity and the value relevance of the individual components for a sample of 101 firms based on Form 20-F filings over the period 1981–1991. They find value relevance for both aggregate reconciliations and for the capitalized goodwill and asset revaluation components of the reconciliations. Their sample is dominated by firms from the United Kingdom, the Netherlands, Australia, and Sweden and includes only three Mexican firms.

Rees and Elgers (1997) extend the work of Amir et al. (1993) by focusing on the reconciliations found in initial Form F-1 registration statements for a sample of 140 (mostly UK, Australian and Canadian) firms for the period pre-1985 through 1991. The authors regress ROE (book value deflated earnings) and the reconciliations (change in stockholders' equity and the change in earnings) on price-to-book value for up to three retrospective years and find statistically significant results for the stockholders' equity reconciliation and some individual components of the reconciliations (goodwill, asset revaluations, and "all else" categories). Regressions of reconciling items on returns were not significant.

Davis-Friday and Rivera (2000) investigate the value relevance of Form 20-F reconciliations for a sample of Mexican ADRs. They find that while both Mexican GAAP and U.S. GAAP earnings and book values are significantly related to ADR prices, the reconciliation from Mexican to U.S. GAAP is not statistically significantly related to ADR prices. The authors suggest that a likely reason for the apparent lack of value relevance for the reconciliation is that Mexican financial statements are adjusted for inflation and the reconciliations exclude the inflation adjustments. The inflation adjustment is likely the largest difference between Mexican and U.S. GAAP.

To our knowledge, no prior study has compared the value relevance of accounting information reported by Mexican ADR and NCL firms. We expect to observe significantly greater value relevance for our ADR firms in comparison with NCL firms. This result is anticipated due to the different information environments in which the two sets of firms operate and not to additional disclosures provided by ADR firms since the U.S. SEC does not require reconciliation of the largest discrepancy between U.S. and Mexican GAAP (i.e., inflation accounting). According to evidence from Bhattacharya et al. (2000), the U.S. capital market appears to be more highly regulated than the Mexican market. Therefore, investors may be more willing to use financial-statement information to set security prices for the ADR firms than for the NCL firms. Our third hypothesis, stated in the alternative, is as follows:

H3. Earnings and book values explain more of the cross-sectional variation in stock prices for ADR firms than for NCL firms.

5. Results

5.1. Data and sample selection

Our primary data source for financial-statement and market data is *Economica*, a commercial database for Latin American companies. *Economica* obtains its firm

Table 1
Sample-selection procedures

	1995	1996	1997	1998	1999
Number of companies traded on BMV	185	193	198	194	188
Number of companies eligible for NYSE	37	51	59	64	60
Number of companies traded on U.S. exchanges ^a	25	28	30	33	34
Less firms missing data on Economatica or Bolsa	(2)	(2)	(2)	(2)	(2)
ADR sample	23	26	28	31	32
Eligible companies not traded on NYSE	14	23	29	32	26
Companies traded OTC ^b	3	5	8	13	8
Less banks				(3)	
Companies traded rule via 144a ^b	1	2	3	4	4
Eligible companies not traded in US	10	16	11	15	14
Non-ADR sample	14	23	29	29	26

^a Teléfonos de Mexico is traded both on the NASDAQ (A shares) and NYSE (L shares). It is only included once in the NYSE totals.

^b Several of the companies traded on U.S. exchanges also have shares traded OTC or listed under Rule 144a. The number of OTC and 144a listings does not include firms that are also listed on ASE, NASDAQ, or NYSE.

financial statement data from the Mexican stock exchange (Bolsa). We obtained security-market betas from Bolsa statistical summaries (*Anuario Bursatil de la Bolsa Mexicana de Valores*) and data for return calculations from the same source. The number of analysts following our sample firms was obtained from *IBES International*.

The financial statement data used in subsequent analyses were prepared using Mexican accounting principles. The accounting data are general price-level-adjusted and translated to U.S. dollars using peso-to-dollar exchange rates at each year-end.¹¹ We do not analyze reconciliations to U.S. GAAP for level 2 and level 3 ADR companies for two reasons. First, we want to be able to compare financial characteristics of ADR and NCL firms on the same basis. Second, previous research (e.g., Davis-Friday & Rivera, 2000) indicates that the reconciliations are not value relevant for Mexican companies. We summarize the sample-selection procedures in Table 1.

The ADR sample consists of all Mexican non-financial services firms with available data that were ever listed on U.S. exchanges during the 1995–1999 period.¹² At the end of 1995, there were 22 Mexican ADRs listed on the New York Stock Exchange (NYSE); three traded on the NASDAQ, and two on the American Stock Exchange (AMEX). By the end of 1999, there were 34 Mexican firms trading on the NYSE, NASDAQ, or AMEX. After excluding the two banks,¹² the ADR sample ranges from 23 to 32 firms for a total of

¹¹ Two inflation adjustment accounts are normally shown in Mexican financial statements. First, any gain or loss in net monetary position is shown in the income statement as part of a comprehensive financing cost category that also includes interest and foreign-exchange gains or losses. The offsetting account for the price-level adjustments for nonmonetary items is included as a component of Shareholders' Equity.

¹² Banks were eliminated due to their differing financial characteristics in comparison with the rest of the sample. This constraint eliminated two financial-services firms (Banca Quadrum and Grupo Financiero Serfin) from the ADR sample and three financial-services firms (Grupo Financiero Banamex Accival, Grupo Financiero BBVA Bancomer and Grupo Financiero Inbursa) from the NCL sample.

140 firm-years.¹³ However, in subsequent analyses, two firm-year observations with negative book values and three outliers (ROE greater than three standard deviations from the mean) were eliminated. Additional missing data (especially price data) further limited the sample in some years (see Table 4). All the sample firms have December 31 fiscal year-ends. The sample includes slightly more Level 3 ADRs than Level 2 ADRs.

The non-ADR sample is also drawn from *Economica*, and includes all additional Mexican firms that meet the NYSE international listing requirements, but are not exchange-listed.¹⁴ This sample includes firms that are listed over-the-counter (OTC) or as private placements (144a).¹⁵ It also includes firm-years for three companies that later listed as Level 2 ADRs: Cemex (1995–1998), Fomento Economico Mexicano (1996–1997), and Grupo Maseca (1995–1997). The annual non-ADR sample-size ranges from 14 to 29 firms (40 different firms) and a total of 121 firm-years.

A summary of the listing status of the sample firms is provided in Table 2. A key difference between the ADR and non-ADR firms (NCL and OTC/144a) is that the exchange-listed firms are much more stable in terms of meeting the NYSE listing requirements. Panel A shows that of the 32 ADR firms in the sample 23 were listed for all 5 years of the sample period. The average number of sample years per firm is 4.38. In contrast, Panel B shows that only 11 of the 40 non-cross-listed (NCL) and OTC/144a firms in the eligible but not exchange-listed sample meet eligibility requirements for all five test-period years. Further, 16 of the 40 firms meet the eligibility requirements only intermittently and, again, three of the firms later become ADRs. The average number of sample years per firm is only 3.03 for the non-ADR sample.

It appears that the majority of eligible Mexican firms have cross-listed their securities in the United States as Level 2 or 3 ADRs. Many of the rest of the firms have only recently or intermittently met NYSE eligibility requirements. For others, we suspect there are idiosyncratic reasons for not cross-listing. For example, Kimberly Clark de Mexico, Sears Roebuck, and Wal Mart de Mexico have U.S. counterparts and there appear to be few benefits to cross-listing for these firms. Grupo Bimbo, an eligible, but non-cross-listed firm, acquired a bakery in Texas in order to take advantage of distribution channels and capital resources in the United States.

It appears that, at least for eligible Mexican companies, the SEC disclosure requirements are not a major constraint to cross-listing. Apparently, the benefits of cross-listing (primarily access to capital, we believe) exceed the costs. Over-the-counter

¹³ The ADR level designations in panel A of Table 2 are the current level designations as disclosed by the Bank of New York. Note that three previous Level 2 or 3 ADR firms have downgraded to Level 1-Bufete Industrial, Grupo Mexicano de Desarrollo and Grupo Sidek. All three firms traded on the NYSE during our test period, but they presently trade OTC.

¹⁴ The alternate international requirements are: 5,000 worldwide round-lot holders, 2.5 million worldwide public shares, US\$100 million worldwide public market value, and aggregate 3-year pre-tax earnings of US\$100 million together with a minimum of US\$25 million of earnings in each of the two most recent years. The financial conditions may also be fulfilled using operating cash flow.

¹⁵ We conduct our empirical analyses separately on firms that are not cross-listed at all (NCL), OTC and 144a firms, and exchange-listed ADR firms.

Table 2
Sample firms

Panel A: Mexican firms traded on U.S. exchanges through December 1999

Company name	Exchange	Level	Sector	Effective date				
				95	96	97	98	99
Altos Hornos de Mexico ^a	NYSE	2	Steel		x	x	x	x
Biper	NASDAQ	2	Communications				x	x
Bufete Industrial ^a	NYSE	3	Construction		x	x	x	x
Cemex ^b	NYSE	2	Cement Production					x
Coca-Cola FEMSA	NYSE	3	Beverages	x	x	x	x	x
Consorcio G Grupo Dina ^a	NYSE	3	Transportation	x	x	x	x	x
Controladora Comercial Mexicana	NYSE	3	Retail	x	x	x	x	x
Desc	NYSE	3	Holding Company	x	x	x	x	x
Empresas ICA	NYSE	3	Construction	x	x	x	x	x
Fomento Economico Mexicano (FEMSA) ^b	NYSE	2	Beverages				x	x
Gruma ^b	NYSE	2	Food				x	x
Grupo Casa Autrey (Saba)	NYSE	3	Food	x	x	x	x	x
Grupo Elektra	NYSE	2	Retail	x	x	x	x	x
Grupo Imsa	NYSE	3	Steel		x	x	x	x
Grupo Industrial Durango	NYSE	3	Paper Products	x	x	x	x	x
Grupo Industrial Maseca ^c	NYSE	2	Food	x	x	x	x	x
Grupo Iusacell	NYSE	2	Communications	x	x	x	x	x
Grupo Mexicano de Desarrollo ^{a,c}	NYSE	3	Construction	x	x	x	x	x
Grupo Radio Centro	NYSE	3	Communications	x	x	x	x	x
Grupo Sidek ^{a,c}	NYSE	3	Holding Company	x	x	x	x	x
Grupo Simex	AMEX	3	Steel	x	x	x	x	x
Grupo Televisa	NYSE	3	Communications	x	x	x	x	x
Grupo Tribasa	NYSE	3	Construction	x	x	x	x	x
Industrias Bachoco	NYSE	3	Food			x	x	x
Internacional de Ceramica ^c	NYSE	3	Construction	x	x	x	x	x
Pepsi-Gemex	NYSE	2	Beverages	x	x	x	x	x
Savia (Empresas la Moderna)	NYSE	3	Holding	x	x	x	x	x
Teléfonos de Mexico (A)	NASDAQ	2	Communications					
Teléfonos de Mexico (L)	NYSE	3		x	x	x	x	x
Transportación Marítima Mexicana	NYSE	3	Transportation	x	x	x	x	x
Tubos de Acero de Mexico	AMEX	2	Steel	x	x	x	x	x
TV Azteca	NYSE	3	Communications			x	x	x
Vitro	NYSE	3	Mineral Products	x	x	x	x	x
Total				23	26	28	31	32

Panel B: Mexican firms eligible to list on the New York stock exchange

Company name	Exchange			Sector	Effective date				
	144a	OTC	Amex Nasdaq NYSE		95	96	97	98	99
Alfa	x			Holding Company	x	x	x	x	x
Apasco		x		Cement	x	x	x	x	x
Ara Consorcio	x			Construction					x
Argos Embotelladora				Beverage			x		
Bimbo Grupo				Food	x	x	x	x	x
Carso Global Telecom		x		Communications				x	
Cementos Chihuahua				Cement				x	x

Table 2 (continued)

Panel B: Mexican firms eligible to list on the New York stock exchange

Company name	Exchange			Sector	Effective date				
	144a	OTC	Amex Nasdaq NYSE		95	96	97	98	99
Cemex			×	Cement	×	×	×	×	
Cintra				Airlines		×	×	×	×
Coppel				Retail				×	×
Corp Moctezuma				Cement					×
Cydsa				Holding Company		×	×		
El Puerto de Liverpool				Retail	×	×	×	×	×
Empaques Ponderosa		×		Paper Products			×	×	×
Fomento Economico Mexico			×	Beverage		×	×		
Grupo Azucarero Mexico				Food			×		
Grupo Carso (96–99)		×		Holding Company	×	×	×	×	×
Grupo Continental		×		Beverage	×	×	×	×	×
Grupo Gigante				Retail		×	×	×	×
Grupo Industrial Saltillo				Holding Company		×	×	×	×
Grupo Maseca (Gruma)			×	Food	×	×	×		
Grupo Modelo				Beverage	×	×	×	×	×
Grupo Palacio de Hierro				Retail			×		
Grupo Sanborns				Retail			×	×	×
Hylsamex (96–99)		×		Steel Plant		×	×	×	×
Industrias CH				Metallurgy				×	
Jugos del Valle ^c		×		Beverage			×	×	
Kimberly Clark de Mexico		×		Paper Products	×	×	×	×	×
Mexichem				PetroChemical		×	×	×	×
Nuevo Grupo Mexico				Mining	×	×			
Nutrisa				Retail				×	
Panamco				Beverage			×		
Peñoles Industrias				Mining	×	×	×	×	×
Posadas Grupo	×			Tourism/Hotel			×	×	×
San Luis Corp	×			Automotive Parts		×	×	×	×
Sears Roebuck				Retail		×			×
Seguros Com America	×			Insurance				×	
Situr Grupo		×		Tourism/Hotel				×	×
Soriana Organizacion				Retail	×	×	×	×	×
Wal Mart de Mexico (97–99)		×		Retail	×	×	×	×	×
Total	5	10	3		14	23	29	29	26

^a These firms delist after the test period. They are included in the analysis during the time period when they are listed on exchanges.

^b These firms are categorized as exchange-listed firms after they cross-list in the United States and they are also included in the non-cross-listed, but eligible sample during the years before they cross-list.

^c These firms trade shares on an organized exchange as well as over the counter (OTC). In the analysis that follows, they are only included in the “exchange” firm analysis.

(OTC) and 144a firms also have the opportunity to benefit from raising private capital, but without incurring the costs of SEC registration. Later, we provide evidence bearing on the viability of this option.

5.2. Industry classifications

Our analysis of the differences between ADR and non-ADR firms begins with a description of their respective industry (sector) distributions in Table 3. Based on the sector names from *Economatica*, the ADR and non-ADR firms represent 18 different sectors. The 32 ADR firms are in 11 different sectors and the 40 non-ADR firms are in 16 different sectors. While we find broad industry representation for both samples, there are also substantial industry differences. The top four industries represent over 59% of the firm-year observations in the ADR sample (communications 18.7%, construction 15.6%, steel 12.5%, and food 12.5%). In contrast, even though the non-ADR sample is more diverse in terms of industry representation, the top four industries (retail 22.5%, beverages 12.5%, cement 10.0%, and holding companies 10.0%) comprise 55.0% of that sample.

The apparent sector self-selection for cross-listing creates two potential problems. First, any observed differences in the overall financial characteristics of the samples have the potential to be industry-specific. Second, the lack of comparable industry data for the ADR and non-ADR samples makes it difficult to perform a matched sample analysis along the lines of previous studies (e.g., Ely & Pownall, 1999; Lang et al., 2003). In an attempt to deal with both problems, we present overall sample results and also discuss results for a reduced sample of five industries that have sufficient comparative data.

Table 3
Industry distribution of the exchange-listed ADR firm and eligible firm samples

	Sector name ^a	Exchange-listed firms				Eligible firms			
		#	%	Firm years	%	#	%	Firm years	%
1	Airline	0	0.00	0	0.0	1	2.5	4	3.31
2	Automotive Parts	0	0.00	0	0.0	1	2.5	4	3.31
3	Beverages	3	9.37	12	8.6	6	12.5	16	13.22
4	Cement	1	3.13	1	0.7	4	10.0	12	9.91
5	Construction	5	15.62	24	17.1	1	2.5	1	.83
6	Communications	6	18.75	25	17.9	1	2.5	1	.83
7	Food	4	12.50	15	10.7	3	7.5	9	7.43
8	Holding Company	3	9.37	15	10.7	4	10.0	16	13.22
9	Insurance	0	0.00	0	0.0	1	2.5	1	.83
10	Metallurgy	0	0.00	0	0.0	1	2.5	1	.83
11	Mineral Products	1	3.13	5	3.6	0	0.0	0	0.0
12	Mining	0	0.00	0	0.0	2	5.0	7	5.78
13	Paper Products	1	3.13	5	3.6	2	5.0	8	6.61
14	PetroChemicals	0	0.00	0	0.0	1	2.5	4	3.31
15	Retail	2	6.25	10	7.1	9	22.5	28	23.14
16	Steel	4	12.50	18	12.9	1	2.5	4	3.31
17	Tourism/Hotel	0	0.00	0	0.0	2	5.0	5	4.13
18	Transportation (Machinery and Equipment)	2	6.25	10	7.1	0	0.0	0	0.0
Total		32	100.0	140	100.0	40	100.0	121	100.0

^a The sector names are from *Economatica*.

5.3. Descriptive statistics

Table 4, Panel A, presents descriptive statistics pooled over the 1995–1999 test period for financial statement and market variable comparisons of three groups: ADR, OTC/144a, and NCL firms. Panel B presents various ratio and growth-performance measures for the three groups and significance tests are summarized in Panel C. The data are somewhat skewed by larger firms, so the medians are better measures of central tendency than the means.

Panel A of Table 4 shows that Mexican ADR firms tend to be nominally smaller than both the NCL and OTC/144a firms. For example, for the six financial statement variables, five of the ADR medians and four of the six means are smaller than those of the other two groups. In addition to the size differences, of particular interest is the apparent higher financial leverage and lower profitability of the ADR sample compared especially to the NCL firms.

Several market-value measures are presented in Panel A. Market value of equity (MVE) is nominally highest for the OTC/144a firms and lowest for the ADR firms. The relative-size variable (ratio of MVE to total market capitalization of the Bolsa) is also highest for the OTC/144a firms and lowest for the ADR firms. We were only able to obtain small samples of beta and returns data, therefore it is difficult to generalize much from these results, but there is some evidence of lower returns for the ADR firms. Finally, analyst coverage tends to be highest for the OTC/144a firms with little difference in coverage between ADR and NCL firms.

An overall conclusion from Panel A of Table 4 is that, after meeting threshold size requirements for listing on the NYSE, the relative size of a firm is not a determinant of cross-listing (i.e., relatively smaller eligible firms do not avoid cross-listing) status for Mexican firms.

Panel B of Table 4 summarizes financial and market-performance measures for the three groups. Even after deleting outliers, the distributions remain somewhat skewed so we again focus more heavily on the medians. Here, the overall conclusion is that the financial performance of the ADR firms is weaker than that of both the NCL and OTC/144a firms over the 1995–1999 test period. For example, the mean (median) ROEs for the ADR sample of –10.5% (10.1%) is significantly lower than the mean (median) ROEs of 13.7% and 14.7% (16.2% and 13.2%) for the respective OTC/144a and NCL samples. Further, the relatively lower ROEs for the ADR firms are impacted by significantly higher leverage (Assets/Equity) in comparison with the NCL firms. The ROA measures are also significantly lower for the ADR firms. Further analysis shows that the ROA results are driven by both significantly lower profit margins and asset turnover for the ADR firms. Based on the growth in total assets variable, it also appears that historical growth has been lower for the ADR firms than for the other two groups.

Further analysis shows that an important difference in the distributions of ROE and ROA for the ADR firms in comparison to both the OTC/144a and NCL groups is the presence of 36 negative observations for the ADR group compared with only four negative observations for the other two groups combined. The negative observations remain even after deleting negative book-value observations (2) and outliers greater than three standard deviations from the original means of the distributions (3). In fact, 19 of the 32 ADR firms

Table 4

Descriptive statistics (1995–1999)

Panel A: Financial statement and market variables

Variable	N	Exchange-listed ADR firms ^a			N	OTC and 144a firms ^a			N	Non-cross-listed firms ^a		
		Mean	S.D.	Median		Mean	S.D.	Median		Mean	S.D.	Median
Assets	135	2105	3040	1172	48	2477	2810	1634	73	1936	2094	1389
Liabilities	135	997	1071	682	48	1151	1293	600	73	786	1142	467
Equity	135	1027	2098	488	48	1021	855	983	73	975	830	742
Net income	135	113	378	39	48	153	181	73	73	148	180	97
Operating cash flow	135	227	663	81	47	265	500	147	73	233	296	161
Investing cash flow	135	–143	339	–63	47	–220	461	–96	72	–192	260	–99
MVE	135	7755	16,418	3263	48	16,302	21,216	7025	73	9500	9429	6253
Relative size	135	0.075	0.167	0.030	48	0.15	0.19	0.07	73	0.092	0.097	0.055
Beta	67	0.653	0.404	0.670	31	0.85	0.30	0.93	42	0.660	0.315	0.629
Returns	29	1.082	2.736	0.101	26	1.19	3.07	0.19	21	1.336	3.028	0.313
Analysts	91	12.396	6.031	13.000	37	16.51	6.48	19.00	42	13.214	7.380	12.500

Panel B: Performance measures

Variable	N	Exchange-listed ADR firms ^b			N	OTC and 144a firms ^b			N	Non-cross-listed firms ^b		
		Mean	S.D.	Median		Mean	S.D.	Median		Mean	S.D.	Median
ROE ^b	135	–0.105	1.645	0.101	48	0.137	0.162	0.162	73	0.147	0.078	0.132
Leverage	135	3.724	11.042	2.372	48	2.599	1.745	2.090	73	1.952	0.945	1.616
ROA	135	0.037	0.086	0.042	48	0.075	0.058	0.078	73	0.081	0.040	0.074
Asset turnover	135	0.697	0.482	0.604	48	0.643	0.292	0.602	73	0.865	0.365	0.777
Profit margin	135	0.042	0.222	0.060	48	0.112	0.132	0.125	73	0.111	0.078	0.096
Growth (TA)	135	0.344	0.476	0.291	47	0.635	1.466	0.379	61	0.342	0.512	0.319
EPS	135	0.117	0.683	0.041	48	0.254	0.288	0.155	72	0.243	0.281	0.139
BVS	135	1.886	2.938	0.630	48	1.745	1.455	0.884	72	1.639	1.427	1.012
PE	88	19.895	24.293	13.760	38	15.339	10.212	13.355	55	20.250	25.316	15.580
PB	125	1.864	1.768	1.410	44	2.217	1.442	1.785	61	1.974	0.876	1.910
Revenue ratio	135	0.767	0.233	0.822	48	0.838	0.216	0.907	72	0.772	0.225	0.815

Panel C: *T* and *Z* statistics from comparisons of mean and median differences

	Non-cross-listed firms vs. exchange-listed ADRs ^c		OTC and 144a firms vs. exchange-listed ADRs ^c		Non-cross-listed firms vs. OTC and 144 A firms ^c	
	Mean	Median	Mean	Median	Mean	Median
<i>Panel A: Variable</i>						
Assets	–1.48	0.58	–0.52	1.27	–0.84	0.90
Liabilities	–2.76**	–2.35 ^{###}	–1.23	0.09	–1.38	1.58
Equity	–0.25	2.63 ^{###}	–0.03	2.03 ^{###}	–0.29	0.00
Net income	0.90	4.66 ^{###}	0.95	3.39 ^{###}	–0.14	–0.20
Operating cash flow	1.53	3.46 ^{###}	1.22	2.81 ^{###}	–0.40	0.18
Investing cash flow	–0.52	–3.10 ^{###}	–1.25	–2.41 ^{###}	0.39	0.61
MVE	0.29	1.87 ^{##}	2.51**	4.35 ^{###}	–2.21**	2.77 ^{##}
Relative size	0.89	2.13 ^{##}	2.36**	3.25 ^{###}	–1.91*	1.23
Beta	0.10	–0.02	2.74**	2.66 ^{##}	–2.67**	2.97 ^{###}
Returns	0.30	0.80	0.14	0.63	0.16	0.57
Analysts	0.63	0.50	3.32***	3.46 ^{###}	–2.12**	2.12 ^{##}

Table 4 (continued)

Panel C: *T* and *Z* statistics from comparisons of mean and median differences

	Non-cross-listed firms vs. exchange-listed ADRs ^c		OTC and 144a firms vs. exchange-listed ADRs ^c		Non-cross-listed firms vs. OTC and 144 A firms ^c	
	Mean	Median	Mean	Median	Mean	Median
<i>Panel B: Variable</i>						
ROE	1.78*	3.53 ^{###}	1.69*	3.24 ^{###}	0.41	0.72
Leverage	−1.85*	−4.54 ^{###}	−1.14	−1.23	−2.35**	2.01 ^{##}
ROA	5.00***	4.62 ^{###}	3.37***	3.47 ^{###}	0.65	−0.09
Asset turnover	2.82***	3.90 ^{###}	−0.92	0.15	3.71***	−3.33 ^{###}
Profit margin	3.23***	3.45 ^{###}	2.57**	3.46 ^{###}	−0.04	1.26
Growth (TA)	−0.03	−0.09	1.33	1.88 [#]	−1.31	1.83 [#]
EPS	1.86*	5.85 ^{###}	1.90*	4.74 ^{###}	−0.21	0.25
BVS	−0.81	3.29 ^{###}	−0.43	2.83 ^{###}	−0.39	−0.14
PE	0.08	0.77	−1.48	−0.48	1.29	1.25
PB	0.57	2.23 ^{##}	1.31	1.93 [#]	−0.99	0.19
Revenue ratio	0.16	0.60	1.94*	1.63	−1.63	0.77

Variable definitions

Assets	Book value of total assets;
Liabilities	Book value of total liabilities;
Equity	Book value of common equity;
Net income	Total net income;
Operating cash flow	Net cash from operating activities;
Investing cash flow	Net cash from investing activities;
MVE	December 31 market value of common equity per share times the number of outstanding shares;
Relative size	The ratio of the firm's market value of equity in year <i>t</i> to the total Bolsa market capitalization in the same year.
Beta	The coefficient of variation between the firm's stock price and the market as reported by the Bolsa;
Returns	Annual percentage change in the market value of common equity;
Analysts	The number of analysts providing estimates in the I/B/E/S international database;
ROE	Return on common equity (net income/equity);
Leverage	Total assets/equity;
ROA	Return on assets (net income/assets);
Asset turnover	Sales/assets;
Profit margin	Net income/sales;
Growth (TA)	The 36-month change in total assets;
EPS	Earnings per share (net income/outstanding common shares);
BVS	Book value per share (equity/outstanding common shares);
PE	Price-earnings ratio (market value of common equity per share/earnings per share);
PB	Price-to-book ratio (market value of common equity per share/book value of common equity per share);
Revenue ratio	The ratio of domestic revenue to total revenue.

^a The data, except ratios and percentages, are totals in terms of millions of U.S. dollars.^b There are 36 negative ROE observations in the ADR sample, three in the OTC and 144a sample and one in the NCL sample.^c ***, **, * (###, ##, #) The test of the mean (median) difference is statistically significant at the 1%, 5%, or 10% level, respectively, two-tailed, based on a *t*-test (Wilcoxon Rank sum test).

in the sample had at least one year of negative ROE/ROA. The wide distribution of net income/net loss particularly impacts the standard deviation of ROE (1.645) for the ADR group. The negative observations are indicative of weaker financial performance after cross-listing for the ADR firms, since the stock exchanges require at least 3 years of positive earnings prior to cross-listing.¹⁶

The weaker financial performance for the ADR sample (and expectations of weaker future performance) is also reflected in the price-to-book (PB) and price-to-earnings (PE) ratios. The median PB ratio of 1.410 for the ADR sample is significantly lower than the median PBs of 1.785 and 1.910 for the respective OTC/144a and NCL samples. While the differences in the PE ratio means and medians are not significant, the median ratio is nominally lower for the ADR sample.

Panel C of Table 4 summarizes the results of pairwise comparisons of mean and median differences for the three groups. Most of the significant differences have been noted above. The primary additional insight is that there are significant differences in the variables for all three groups. Based on ROE and ROA measures, financial performance is strongest for the OTC/144a firms and weakest for the ADR firms. The NCL firms differ most prominently from the ADR and OTC/144a firms in terms of their lower financial leverage. The significant differences among all three groups cause us to analyze each group separately in Tables 6–9.

We now report on untabulated analyses of ADR and NCL differences for a small sample of industry-matched firms. We include all firms with at least 4 years of data from the following industries (number of ADR and NCL firms, respectively, from each industry in parentheses): food (2,1), holding companies (3,3), paper products (1,1), retail (2,3), and steel (4,1). Thus, the reduced sample includes only 12 ADR and nine NCL firms, and at most, 56 (47) pooled observations for the ADR (NCL) groups.

The results for the reduced sample are very consistent with those for the full sample reported in Table 4. For example, we still observe the significant size difference between the two groups. One indicator of the size difference is MVE (market value of equity). The mean (median) for the NCL group is 22,197 (17,817) in comparison with 5351 (3317) for the ADR group. The results for the performance measures are also generally consistent with those in Table 4. While the nominal difference in ROE (NCL lower) is no longer significant, the ROA and leverage differences remain significant, indicating that ROE is impacted by higher leverage for the ADR group. For the full sample, the ROA difference was driven by significant differences in both profit margin and turnover; for the reduced sample, only the difference in turnover is significant. The results for PB and PE are consistent with those for the full sample. Finally, we note that the revenue ratio (ratio of domestic revenue to total revenue) difference is now significant for the reduced sample. This suggests that, after controlling for firms' industry membership, the exchange-listed ADR firms earn more of their revenues outside Mexico.

¹⁶ Ball, Kothari, and Robin (2000) suggest that financial-reporting environments differ in terms of the timeliness of loss recognition. This explanation does not explain the weaker financial performance that we observe for Mexican ADR firms, however, since in subsequent analyses we find that these firms also exhibit weaker operating cash flow performance.

Table 5
Descriptive statistics before and after cross-listing

Panel A: Financial statement and market variables for exchange-listed ADR firms^a

Variable ^a	N	Before			N	After			Difference tests	
		Mean	S.D.	Median		Mean	S.D.	Median	T ^b (p-value)	Z ^b (p-value)
Assets	26	2.896	4.288	1.178	30	3.071	4.492	1.501	−0.15 (0.88)	−0.86 (0.39)
Liabilities	26	1.133	1.524	0.580	30	1.430	1.792	0.842	−0.66 (0.51)	−0.83 (0.41)
Equity	26	1.697	2.957	0.547	30	1.674	2.954	0.490	0.03 (0.98)	−0.42 (0.68)
Net income	26	0.269	0.536	0.063	30	0.192	0.463	0.050	0.57 (0.57)	1.19 (0.23)
Operating cash flow	26	0.367	0.858	0.004	30	0.289	0.924	0.020	0.33 (0.75)	0.06 (0.95)
Investing cash flow	26	−0.323	0.543	−0.139	30	−0.318	0.765	−0.46	−0.03 (0.98)	−0.45 (0.65)

Panel B: Performance measures for exchange-listed ADR firms

Variable	N	Before			N	After			Difference tests	
		Mean	S.D.	Median		Mean	S.D.	Median	T (p-value) ^c	Z (p-value) ^c
ROE	26	12.40	11.25	10.89	30	2.56	22.43	9.96	2.03 (0.05)*	1.08 (0.28)
Assets/equity	26	1.97	1.19	1.97	30	2.36	1.56	1.83	−1.04 (0.30)	−0.43 (0.67)
ROA	26	5.63	3.88	5.35	30	3.65	7.01	3.98	1.28 (0.21)	1.17 (0.24)
Sales/assets	26	0.44	0.75	0.17	30	0.88	1.17	0.45	−1.65 (0.10)*	−1.17 (0.24)
Net income/sales	19	5.49	0.22	0.24	25	0.61	1.44	0.10	1.55 (0.13)	1.80 (0.07) [#]
Revenue ratio	26	0.83	0.22	0.92	30	0.79	0.27	0.86	0.75 (0.46)	0.77 (0.44)

^a The data are totals in terms of millions of U.S. dollars.

^b * (#) The test of the mean (median) difference between non-ADR and exchanged-listed firms is statistically significant at the 10% level or better, two-tailed, based on a paired t-test (Wilcoxon Rank sum test).

^c Refer to Table 4 for variable definitions.

Using our non-ADR sample as a reasonable local-market benchmark, the weaker performance for Mexican ADR firms, based on financial characteristics, is consistent with the results of Foerster and Karolyi (2000) for their combined 35-country sample based on returns.¹⁷ In an attempt to compare the before-and-after-exchange-listing performance of ADR firms, we work with a reduced sample of levels 2 and 3 ADRs for which we can obtain data for at least 1 year prior to cross-listing. Table 5 compares the financial performance of these firms for 1 or 2 years preceding and for 2 years after ADR listing. While the sample is very small and our tests lack power, an overall conclusion is that financial performance did not improve after cross-listing.

¹⁷ Foerster and Karolyi (2000) also provide evidence that while companies issuing equity on major exchanges in the United States modestly outperform their benchmarks (in contrast to under-performance of private placements), firms that come from emerging markets with low accounting standards (Mexico included) significantly outperform their benchmarks. We do not have enough data to separately analyze private placements versus public placements in terms of financial performance. However, our ADR sample is dominated by public placements (see Table 6), and we believe our results for Mexico are consistent with Foerster and Karolyi (2000) results for emerging market companies in general.

Although the results are not significant, ROE and ROA means and medians are nominally lower after cross-listing. Also note that there does not appear to be any significant reduction in leverage after cross-listing. Again, we caution that this analysis is based on extremely small samples.

Based on the limited before and after cross-listing evidence in Table 5 along with the results of the benchmarking comparison of the performance of ADR firms with non-ADR firms in Table 4, and the prevalence of negative earnings after cross-listing, as noted above, we conclude that the financial-performance results for Mexican ADR firms appear consistent with the results of prior global-equity-offering research; that is, there is no evidence that greater access to capital is associated with improved financial performance for Mexican firms after cross-listing. We know that firms in the exchange-listed sample had to meet the listing requirements of the U.S. exchanges, including 3 years of profitable performance. One potential explanation for the subsequent poor performance is proposed by Ritter (1991), who suggests that firms cross-list when they experience strong performance thereby seizing a “window of opportunity”.

5.4. Capital issuance analysis

As previously noted, Lins et al. (2000) provide evidence that non-U.S. firms issue equity on U.S. stock exchanges to relax capital constraints. Evidence of this constraint is the significantly higher financial leverage of Mexican cross-listed firms in comparison with non-cross-listed (NCL) firms. Further, in a dynamic capital structure environment, Myers and Majluf (1984) and Palepu, Bernard, and Healy (2000) argue that the issuance of new equity represents last-resort financing.

Table 6 summarizes debt and equity issues by Mexican firms in the United States broken down by our sample categories of firms.¹⁸ Several insights are evident from the table. First, much more capital is raised by Levels 2 and 3 ADR firms than by NCL firms. Level 2 or 3 ADR firms raised over 83% of total debt and almost 87% of total equity. Improved access to capital markets, at the expense of meeting SEC disclosure requirements, is clearly a benefit of cross-listing as a Level 2 or 3 ADR. Second, substantially more equity (US\$11.8 billion) has been issued than debt (US\$4.3 billion). The substantially higher equity issuance is consistent with the idea of accessing U.S. markets to loosen financing constraints. At the same time, the issuance of relatively less debt in the United States may be indicative of the close ties Mexican firms have to their domestic bankers (LaPorta et al., 2002). Finally, we note the limited amount of capital that has been raised by OTC and 144a firms.

5.5. Logistic regression results

Tables 3–6 provide evidence of individual differences in various financial and market characteristics among the ADR, OTC/144a, and NCL firms. We now use a Logistic

¹⁸ Data were obtained from the Bank of New York. While Level 2 ADRs may not raise new capital in the United States by issuing new shares, they are not prevented from raising equity capital through private issues.

Table 6
Debt and equity issuance

Classification		Debt		Equity	
		No. of issues	Amount (US\$mil)	No. of issues	Amount (US\$mil)
NCL	Total (number and amount)	3	315.2	14	4579.6
	Average		105.1		327.1
	Median		35.3		117.8
	Standard deviation		129.7		554.1
144a	Total (number and amount)	0	0.0	3	54.9
	Average				18.3
	Median				13.8
	Standard deviation				8.5
OTC	Total (number and amount)	1	165.9	4	215.9
	Average		165.9		54.0
	Median		165.9		41.6
	Standard deviation				49.4
Level 2 ADR	Total (number and amount)	0	0.0	13	1450.2
	Average				111.6
	Median				119.4
	Standard deviation				68.0
Level 3 ADR	Total (number and amount)	8	3603.9	29	8802.3
	Average		450.5		303.5
	Median		160.7		85.0
	Standard deviation		671.2		441.1

regression model to examine the conditional relation between the variables we identified above and the likelihood of cross-listing.

Under the Logit model, the odds of a firm's cross-listing in the United States are described by the conditional ratio of: $P(G_j/X_j)/(1-P(G_j/X_j))$, where $P(G_j/X_j)$ is the probability of being a member of G given X_j . The log-linear function of this probability can be expressed as follows (Maddala, 1991):

$$\text{Log}(P_j/1 - P_j) = A_0 + A_1(\text{Log}X_{j1}) + \dots + A_k(\text{Log}X_{jk}) \quad (1)$$

where: P_j =probability of firm j cross-listing and X_{jk} =the explanatory variables for firm j .

We test the classificatory power of a model that includes the following independent variables from Table 4: MVES (size), ROA (profitability), LEVERAGE (capital structure), GROWTH, REVRATIO (ratio of domestic to total revenue), and INDUSTRY. The variables are chosen based on theoretical considerations and previous empirical research; for example, LEVERAGE is based on the capital-constraint hypothesis (Lins et al., 2000), ROA is a profitability proxy based on prior global equity offering research (Foerster & Karolyi, 2000) and MVES is a proxy for the firm's size and its need for foreign capital based on Saudagaran (1988). GROWTH is also related to the firm's need for capital. We include REVRATIO as proxy for firms' exposure outside their home country (Saudagaran, 1990) and INDUSTRY based on our previous analysis. To avoid

Table 7

Estimate of U.S. cross-listing probability during 1995–1999

Variable (coefficient)	Exchange-listed ADR firms ($n=128$) vs. non-cross-listed firms ($n=61$)	Exchange-listed ADR firms ($n=128$) vs. OTC and 144a firms ($n=47$)	OTC and 144a firms ($n=47$) vs. non-cross-listed firms ($n=61$)
	Coefficient (chi-square)	Coefficient (chi-square)	Coefficient (chi-square)
Intercept (α_0)	-4.98 (11.97)***	3.31 (10.56)	-17.02 (19.75)***
MVES (β_1)	0.02 (5.82)**	-0.02 (3.66)*	0.06 (8.05)***
ROA (β_2)	-0.97 (0.09)	-6.20 (5.51)**	12.02 (2.73)*
LEVERAGE (β_3)	1.75 (22.67)***	0.00 (0.00)	3.46 (17.30)***
GROWTH (β_4)	-0.00 (0.00)	-0.00 (2.15)	0.00 (0.37)
REVRATIO (β_5)	3.29 (9.52)***	-1.93 (3.74)*	11.25 (16.15)***
INDUSTRY (β_6)	-0.07 (3.96)**	0.01 (0.05)	-0.14 (5.88)**
Model statistics			
Concordant percent	80.80	72.60	89.00
Likelihood ratio χ^2 (p -value)	54.00 (<0.00)	19.90 (0.00)	60.93 (<0.00)
Pseudo R^2	24.85%	10.75%	43.12%

Statistically significant coefficients (two-tailed test) are denoted by: ***less than 0.01, **less than 0.05, *less than 0.10.

There are 32 firms listed on the NYSE, NASDAQ, or AMEX, ten firms traded over-the-counter, five firms traded via rule 144a, and 25 firms that are not cross-listed in the United States during the 1995–1999 period, but are eligible to list on the NYSE. $P(\text{ADR})$ =Probability of cross-listing in the United States; MVES is the market value of equity per share; ROA is the ratio of net income to total assets; LEVERAGE is the ratio of total assets to stockholders' equity; GROWTH is the 36-month percentage change in total assets; REVRATIO is the ratio of domestic revenue to total revenue; and INDUSTRY is a dummy variable taking on the value of one when it is equal to category n (defined in Table 3) and zero otherwise.

over-fitting models to our relatively small samples, we do not use the full set of variables in Table 4.¹⁹

The first column of Table 7 summarizes the results for the ADR/NCL comparison. First, the model exhibits reasonable classificatory power, as evidenced by the concordant percentage of 80.80%, in comparison with the naïve hypothesis that all sample firms are ADRs (128 out of 209, or 61.2%). All variables except ROA and GROWTH are significant. As expected, the variable with the highest classificatory power is LEVERAGE. REVRATIO was generally not significant in the univariate tests in Table 4. However, it is highly significant here, but not in the hypothesized direction. MVES is also significant and there is some evidence of an industry effect.

The second column of Table 7 reports the results of the logistic regression for a comparison of ADR and OTC/144a firms. The variables do not improve the classification compared to the naïve hypothesis that all sample firms are ADR firms (concordant percentage, 72.6, naïve percentage of 73.1). Importantly, the LEVERAGE variable is not

¹⁹ We also performed stepwise logistic regressions using various combinations of variables from Table 4 without any improvement in results.

significant. This suggests that these two groups are very similar in terms of the characteristics that we investigate.

The third column of Table 7 reports the results of a comparison of OTC/144a firms with NCL firms. Compared to a naïve hypothesis that all sample firms are OTC/144a firms ($47/108=43.52\%$), the concordant percentage of 89.5% shows the model is very effective in distinguishing between the two groups. Again, the most highly significant variable is LEVERAGE, followed by REVRATIO. All other variables add classificatory power except for GROWTH.

Overall, these results support our first and second hypotheses that ADR firms are more capital-constrained (levered) than NCL firms and they exhibit weaker financial performance after cross-listing.

5.6. Value-relevance hypothesis

The final analyses investigate whether there are differential associations between accounting information and stock prices for ADR firms, which, due to cross-listing, may operate in a different information environment than NCL firms. Our tests are based on standard regressions of accounting book value (BVS) and earnings (EPS) on market value of equity (MVS) as in Amir et al. (1993).²⁰ In Table 8, we present both individual-year and pooled (1995–1999) results for the ADR, OTC/144a and NCL samples.²¹

While we report results for all three groups, we focus primarily on the NCL and ADR comparisons here. Table 8 provides evidence of a significant difference in the explanatory power of the accounting variables for the two groups.²² The pooled, adjusted R^2 for the ADR sample in Panel A is 0.71 and individual-year R^2 s range from 0.55 to 0.88. In contrast, the adjusted R^2 for the pooled NCL sample in Panel C is essentially zero, and only in 1 year, 1995, is there evidence of explanatory power on a par with the ADR group.²³ Both BVS and EPS are significant in the pooled regression for the ADR group. BVS for the ADR group is also highly significant in all of the individual regressions, while EPS is only significant in 1997. The anomalous result for the NCL sample is the highly significant result for 1995 and the corresponding low explanatory power for the other 4 years.²⁴

We also estimate pooled regression results for separate Level 2 ADR, Level 3 ADR, OTC, and 144a samples (untabulated). The results are interesting. There is significant explanatory power (adjusted R^2 of 0.63) for BVS for the 144a group; however, the result is based on only 14 observations. For the OTC group, the adjusted R^2 is 0.44, and both BVS and EPS are significant. We find the strongest results for the Level 2 ADR group (adjusted R^2 of 0.83) where both BVS and EPS are significant. Finally, the adjusted R^2 for the Level

²⁰ The results are the same whether MVS is measured at December 31 or March 31.

²¹ Correlation analyses for both pooled samples indicate significant associations among all the accounting and market variables and no significant association with the time period (year).

²² We estimated F -statistics for comparing nested regression models and found that, except in 1995, the adjusted R^2 is significantly higher in the ADR sample estimation.

²³ Again, we caution that individual-year regressions, particularly as reported in Panels B and C, are for extremely small samples.

²⁴ However, this anomaly results from a regression with only eight observations.

Table 8

Relation between annual stock prices and summary financial-statement measures^a
 $MVS_{it} = \gamma_0 + \gamma_1 EPS_{it} + \gamma_2 BVS_{it} + \varepsilon_{it}$

Variable	Coefficient	Pooled	1995	1996	1997	1998	1999
<i>Panel A: ADR sample</i>							
Obs		132	21	22	24	28	29
Intercept	γ_0	2.69 (2.42)**	3.91 (1.76)*	3.84 (1.72)*	1.52 (1.19)	2.41 (1.47)	1.11 (0.55)
EPS	γ_1	2.71 (1.66)*	12.63 (1.39)	5.28 (0.93)	4.40 (2.98)**	3.01 (0.62)	−9.80 (−1.41)
BVS	γ_2	5.98 (15.49)***	4.39 (4.07)***	3.94 (2.86)**	8.28 (12.44)***	4.54 (5.95)***	7.53 (5.28)***
Adjusted R^2		0.71	0.69	0.60	0.88	0.55	0.64
<i>Panel B: OTC and 144a sample</i>							
Obs		47	2	6	10	13	12
Intercept	γ_0	9.11 (3.96)***	NA	16.21 (2.27)*	9.78 (2.65)**	10.39 (2.79)**	3.34 (0.97)
EPS	γ_1	30.45 (4.13)***	NA	131.43 (1.26)	67.09 (4.07)***	50.02 (2.83)**	66.81 (3.96)***
BVS	γ_2	3.66 (2.61)**	NA	−29.10 (−1.09)	−3.42 (−0.97)	1.29 (0.62)	−1.63 (0.72)
Adjusted R^2		0.61	NA	0.24	0.83	0.47	0.83
<i>Panel C: Non-cross-listed sample</i>							
Obs		71	8	16	16	14	13
Intercept	γ_0	13.49 (5.88)***	−1.94 (−1.02)	15.41 (2.52)**	12.36 (2.40)**	13.19 (2.12)**	19.35 (3.43)**
EPS	γ_1	−2.76 (−0.36)	12.75 (1.43)	2.79 (0.16)	−25.90 (−1.38)	78.12 (1.12)	29.24 (0.53)
BVS	γ_2	0.74 (0.48)	12.57 (3.99)**	−0.35 (−0.13)	4.52 (1.19)	−14.56 (−0.94)	−6.15 (−0.83)
Adjusted R^2		NA	0.91	NA	NA	0.05	NA

MVS=December 31 price, BVS=Book value per share, and EPS=Net income per share. *T*-statistics are in parentheses. Statistically significant coefficients (two-tailed test) are denoted by: ***less than 0.01, **less than 0.05, *less than 0.10.

^a Each estimated coefficient is expected to be positive.

3 ADRs is 0.65, but only BVS is significant. These results support the third hypothesis that ADR (and OTC/144a) firms' accounting information is more highly associated with stock prices than that of NCL firms.

5.7. Sensitivity analysis: quality of earnings

So far, we have provided consistent evidence that Mexican NCL firms are financially stronger than ADR firms, based on the measures we examine. However, Lang et al. (2003) find evidence of greater income-smoothing behavior by NCL firms. The authors' results are for data pooled over 26 countries. In the case of Mexico, there is also reason to expect greater smoothing behavior on the part of NCL firms due to the belief that domestic regulatory control may not be very effective.

In Table 9, we summarize the results of smoothing tests based on relations between the cash flow and accrual components of earnings. First, in Panel A, note that the variability of accruals and cash flows from operations is always nominally greatest for the ADR firms in comparison with the other two groups. Particularly in the case of cash flow from operations, the greater variability may indicate that Mexican ADR firms are riskier than Mexican NCL firms. *Ceteris paribus*, the NCL firms should exhibit smoother earnings than the ADR firms. Thus, evidence indicating a difference in smoothing measures between the groups is not necessarily indicative of a difference in the quality of earnings. Finally, these tests provide additional support for our financial-performance analyses since the mean and median cash flows from operations are significantly lower for the ADR firms in comparison with the other groups.

In Panel B of Table 9, we present the results of correlation tests between accruals and cash flows for the two groups. As in Lang et al. (2003), a more negative cash flow/accrual correlation is indicative of earnings management in the sense of using accruals to

Table 9
Quality of earnings analysis

Panel A: Descriptive statistics^a

Variable	N	Non-cross-listed firms			N	OTC and 144a firms			N	Exchange-listed ADR firms		
		Mean	S.D.	Median		Mean	S.D.	Median		Mean	S.D.	Median
Accruals	73	-0.037	0.054	-0.040	47	-0.020	0.076	-0.033	135	-0.043	0.102	-0.035
Cash flows from Ops	73	0.118	0.052	0.130	47	0.095	0.080	0.110	135	0.080	0.111	0.078

Panel B: *T* and *Z* statistics from comparisons of mean and median differences

Variable	Non-cross-listed firms vs. exchange-listed ADRs		OTC and 144a firms vs. exchange-listed ADRs		Non-cross-listed firms vs. OTC and 144 A firms	
	Mean	Median	Mean	Median	Mean	Median
Accruals	0.44	-0.13	1.46	0.86	-1.54	0.85
Cash flows	2.79***	4.08 ^{###}	0.87	2.13 ^{##}	1.91*	-1.26

Panel C: Spearman correlations among cash flows and accruals (1995–1999)^a

Group	Coefficient	Z-statistic (<i>p</i> -value)
Non-cross-listed firms	-0.75	
Exchange-listed firms	-0.54	-1.92 (0.05)
OTC and 144a firms	-0.67	
Exchange-listed firms	-0.54	0.24 (0.81)
Non-cross-listed firms	-0.75	
OTC and 144a firms	-0.67	1.37 (0.17)

Variable definitions

Accruals	The difference between net income and cash flows from operations scaled by total assets
Cash flows from operations	Net operating cash flows scaled by total assets

^a ***, **, * (^{###}, ^{##}, [#]) The test of the mean (median) difference is statistically significant at the 1%, 5%, or 10% level, respectively, two-tailed, based on a *t*-test (Wilcoxon Rank sum test).

smooth variability in cash flows. We find that the correlation between cash flows and accruals is significantly more negative for NCL firms than for ADR firms. The differences for the ADR versus OTC/144a and NCL versus OTC/144a comparisons are not significant.

In untabulated results, we also examine the frequency distributions of earnings to assess the frequency of small, positive earnings for the two groups as in Burgstahler and Dichev (1997). There is no evidence of any difference in the distribution of small positive earnings between the groups. This result is contrary to the results for Lang et al. (2003) as expressed in hypothesis four. Taken together, these results suggest that the differences in financial characteristics we observe are probably not an artifact of accounting.

In summary, our tests of various financial characteristics indicate that Mexican ADR firms are more highly levered and that they have raised significantly more capital in the United States than non-exchange-listed firms. Further, the results indicate that, after cross-listing, Mexican ADR firms are financially weaker than NCL firms. While there is some (weak) evidence that reported earnings for NCL firms are smoother than reported earnings for ADR firms, it is more likely that such differences reflect real differences in economic performance (e.g., lower mean and higher variability of cash flows for ADR firms) rather than differences in the prevalence of earnings management for the two groups.

6. Conclusion

This paper examines the characteristics of Mexican companies that cross-list their securities in the United States. It has been suggested that the SEC disclosure requirements serve the purpose of restricting the access of weaker foreign companies to U.S. capital markets. However, we provide evidence that Mexican ADR firms exhibit weaker financial performance than non-cross-listed (NCL) firms. For example, we document a high percentage of negative earnings observations for ADR firms and relatively few negative earnings numbers for NCL firms. Additionally, our comparisons of Mexican ADR and NCL companies indicate that ADR firms are more highly levered than non-cross-listed (NCL) companies and we document the significant amount of equity capital they have raised in the United States in an attempt to loosen capital constraints. Logistic regression models using financial variables as inputs are highly significant in correctly classifying ADR and NCL firms. The results indicate that the substantially higher leverage for ADR firms is an important financial characteristic that differentiates the two groups. Finally, we test the relative quality of financial-statement numbers for ADR and NCL firms, and conclude that accounting-quality differences do not explain the differences in financial performance.

We also hypothesized that financial disclosures for Mexican ADR firms will be more value relevant than for NCL firms. Our regressions of share price on book value per share and earnings per share reveal significant explanatory power for the ADR firms and generally insignificant results for NCL firms. The results indicate that financial statements are value relevant for ADR investors, but not for investors in Mexican companies that do not cross-list in the United States. The results may indicate that the SEC regulations add credibility to the financial statements of ADR firms. In contrast, the lack of value

relevance of financial statements for NCL firms may be indicative of market inefficiency (e.g., insider trading) in the Mexican market as suggested by Bhattacharya et al. (2000).

The results from our research underscore the importance of focusing on a single country where market institutions and corporate-governance mechanisms can be carefully considered. Our focus on a single country is also important due to the tendency of previous studies to generalize based on multi-country samples, particularly samples dominated by Australian, Canadian, and U.K. firms. Of course, the benefits of our single country, Mexican market focus are offset somewhat by data limitations and constraints from working with relatively small samples.

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Discussion

Discussion of “The financial performance, capital constraints and information environment of cross-listed firms: Evidence from Mexico”

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1. Introduction

The paper by Davis-Friday, Frecka and Rivera (2005) provides new evidence regarding Mexican firms cross-listed in the United States (CL) as Level 2 and Level 3 ADRs (i.e., exchange-listed ADRs). The paper's main research question is to examine whether there are systematic differences between the pre- and post-listing performance and capital structure of Mexican firms choosing to list on a United States stock exchange and non-cross-listed Mexican firms that were nevertheless eligible to list (NCL).

The paper identifies three major reasons why looking at Mexican CL vs. NCL firms is important. First, Mexico represents one of the largest United States trading partners. Second, Mexican accounting rules and corporate environment differ substantially from those in the United States. Third, even though Lang, Raedy, and Yetman (2003) compare CL to NCL firms in terms of accounting quality, Mexican firms are not included in their sample.

The authors develop three hypotheses. First, they expect that CL firms will be more capital constrained than NCL firms and this will force them to cross-list to raise equity capital. Second, they expect that CL firms will exhibit poorer performance after the cross-listing relative to NCL firms and relative to their own performance prior to the listing. They base this expectation on research showing that return performance decreases, on average, after the listing (Errunza & Miller, 2003). Their final hypothesis states that CL firms are expected to have greater accounting relevance after the cross-listing relative to NCL firms. In general their results support all three hypotheses.

The paper is well motivated and addresses a very important question with policy implications regarding the ongoing debate about United States foreign-listing policy. My discussion will focus mainly on the hypotheses and results.

Hypothesis 1. Hypothesis one states that ADR firms have greater pre-listing leverage compared to NCL firms.

Even though the hypothesis is well supported the method used to test it can be improved in a number of ways. The hypothesis assumes that, given that ADR firms are highly levered, they cross-list in the United States to raise capital. So if raising capital is an important factor in the decision to cross-list then why do firms list as Level 2 ADRs, which precludes them from publicly raising capital? To put it another way, how can we explain the decision to cross-list based on leverage if our sample includes firms that list in the United States without the intention of making a new public-equity issue? A simple way to avoid this problem is to perform the analysis by splitting cross-listed firms into two groups. Those that list with the intention of raising equity (ADR Level 3 and listings under Rule 144A) vs. those listing without this intention (Level 2 ADRs and OTC listings).

If firms cross-list in need of new capital as evidenced by high leverage, what precludes them from raising capital in the home market? In other words, leverage by itself can only explain the need for additional capital. The need to raise capital in another market can only be explained by the firm's inability to raise new equity in the home market. Thus the authors can consider a variable that captures not only the need for new equity, but also the need to raise equity abroad. This can be captured by the relative size of the firm in the home market (for example the percentage of the firm's market capitalization in relation to the capitalization of the market). The larger the relative size of the firm in the home market the greater the need to raise capital outside the home market and, hence, the greater the probability of cross-listing (Biddle & Saudagaran, 1989).

The authors test Hypothesis 1 using logistic regression. They break their sample in groups of two (ADRs vs. NCL firms, ADRs vs. OTC/144A firms, and OTC/144A firms vs. NCL firms) and explain the decision to cross-list based on a number of variables including leverage. Conference participants suggested the use of ordinal logit to explain the effects of leverage on the cross-listing decision through the creation of three groups: i.e., ADRs, OTC/144A, and NCL firms (assuming that the parallel lines assumption is not violated).

Hypothesis 2. Hypothesis 2 states that ADR firms will exhibit weaker post-listing performance compared to NCL firms or their own performance prior to the listing.

Even though prior papers have shown that return performance is weaker after the listing these papers based their expectations and findings on solid theoretical grounds. The paper seems to be underplaying the importance of theory for this hypothesis. Even though results show the return underperformance the paper would benefit from a more thorough discussion on possible causes and perhaps further tests. For example, is this post-listing return underperformance due to decreased risk (Errunza & Miller, 2000) or is it due to poorer than expected earnings? If it is the former, is this due to increased information (Botosan, 1997) or market segmentation/risk sharing effects (Foerster & Karolyi, 1999)?

The paper would benefit from a more adequate development of the hypothesis and better explanation of results.

Hypothesis 3. According to Hypothesis 3, earnings and book values explain more of the cross-sectional variation in stock prices for ADR firms than for NCL firms.

The authors suggest that this expectation is based on differences in financial-reporting environments rather than the additional disclosures provided by ADR firms since ADR firms are not required to reconcile the largest difference between Mexican GAAP and U.S. GAAP, inflation accounting. It is quite plausible that the additional disclosures and reconciliations that Mexican firms are required to provide may still be important even in the absence of the inflation-adjustment given that Mexico is classified as a country with very low disclosure levels and very high conservative accounting practices (Radebaugh & Gray, 1997). Since Mexico and U.S. information environments are so different, the reconciliations to U.S. GAAP could increase the usefulness of accounting information. In addition, measuring prices on December 31 may be exacerbating the differences between NCL and CL firms. Measuring the association between earnings and prices on December 31 assumes that the market anticipates the earnings information to the same degree for both CL and NCL firms. If Mexican earnings are more difficult to predict, due to lower transparency, such an association will be weaker for NCL firms by construction, possibly not because earnings are less associated with prices but because prices do not incorporate the earnings information on the measurement date. The revised version of the paper includes a sensitivity test measuring price on March 31.

It would also be interesting to test for differences in the relevance of accounting information between the pre- and post-listing period for the ADR sample firms. In other words, instead of comparing the post-listing relevance of accounting information of ADR firms with NCL firms, the authors could have looked at the change in the post-listing performance of ADR firms compared to their own performance prior to the listing. This way firms would serve as their own control, thus alleviating self-selection issues. In addition, the sample size would marginally improve.

2. General

In general the paper is well written and adequately motivated. The hypotheses are clearly stated and the method well executed. However, I think the paper's scope could have been expanded. For example the authors could have looked at the issue of Mexican firm cross-listings from two angles. First, they could have expanded the scope of Hypothesis 1 by looking at the determinants of the decision to cross-list by including explanatory variables other than just leverage. These could include, for example, the size of the firm relative to the domestic market, the importance of the U.S. product market, the percentage of shares held by U.S. investors, the intention to get involved in M&A activity, etc. Second, the authors could have looked at the effects of cross-listing (Hypotheses 2 and 3) by performing longitudinal analysis on performance, relevance of accounting information, and perhaps cost of capital and liquidity effects.

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Reply

Response to discussant of “the financial performance, capital constraints and information environment of cross-listed firms: Evidence from Mexico”

Paquita Y. Davis-Friday*, Thomas J. Frecka, Juan M. Rivera

1. Introduction

We thank the discussant for her comments. We believe that where possible we have addressed them in the revised version of the manuscript and we believe they have improved the document. The comments focus primarily on our hypotheses and results and we provide responses to them in that order.

2. Hypotheses

The discussant notes that Hypothesis 1 assumes that given that ADR firms are highly levered they cross list in the United States to raise capital. She suggests that if raising capital is an important factor in the decision to cross list then firms should list as Level 3 ADRs, as opposed to Level 2, which would allow them to raise capital publicly. She, therefore, suggests that we should compare firms that list with the intention of raising equity (ADR Level 3 and listings under Rule 144A) to those listing without this intention (Level 2 ADRs and OTC listings).

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We explain that while it is true that the majority of capital raised is by Level 3 ADR firms, the other cross-listed firms are able to raise capital through private placements. Additionally, we identify five firms that shift from Level 1 to Level 2 or 3, which would suggest that they do intend eventually to raise capital. Finally, the descriptive statistics from individual groups (NCL, 144A, OTC, Level 2 and Level 3) indicate that the OTC firms are most like 144A firms and Level 2 and 3 firms are most similar. Therefore, we believe that the current groupings provide the most powerful setting for our tests.

The discussant asks if firms in need of new capital, as evidenced by high leverage, cross list, what precludes them from raising capital in the home market? She suggests that the need to raise capital in another market can only be explained by the firm's inability to raise new equity in the home market. Therefore, as she suggests, we attempt to assess the need to raise equity abroad by examining a variable that measures the relative size of the firm in the home market (the percentage of the firm's market capitalization in relation to the capitalization of the domestic market as in Biddle and Saudagaran, 1991).

Variable	Non-cross-listed firms vs. OTC and 144 A firms ^a		Non-cross-listed firms vs. exchange-listed ADRs ^a		OTC and 144A firms vs. exchange-listed ADRs ^a	
	Mean	Median	Mean	Median	Mean	Median
Relative size	*-1.91	1.23	0.89	##2.13	**2.36	###3.25

The results indicate that OTC and 144a firms on average represent significantly larger portions of the domestic market cap than non-cross-listed firms while exchange-listed ADRs are not significantly different from non-cross-listed firms and have relative sizes that are significantly smaller than OTC and 144a firms. This would suggest that the most capital-constrained firms are those that seek capital over-the-counter and through private placements.

The discussant and conference participants suggested the use of ordinal logit to explain the effects of leverage on the cross-listing decision through the creation of three groups: i.e., ADRs, OTC/144A, and NCL firms (assuming that the parallel-lines assumption is not violated).

The results from the ordered logit simply capture the shift in intercept across the three groups and the intercepts differ significantly according to the expected ordering: NCL, OTC/144A, and ADR. The results also indicate that size (market value of equity or relative size), industry, and ROE are the most important determinants of the ordering. When ROA is used instead of ROE, the leverage variable becomes significant while ROA is not.

3. Hypothesis 2

Hypothesis 2 states that ADR firms will exhibit weaker post-listing performance compared to NCL firms or their own performance prior to the listing. The discussant suggests that the paper seems to underemphasize the importance of theory for this hypothesis. She suggests that we provide a more thorough discussion on possible causes

and perhaps conduct further tests. We reviewed the suggested literature and included an additional discussion of Errunza and Miller (2000) in Section 4.1 of the paper.

4. Hypothesis 3

The discussant suggests that the expectation that earnings and book values explain more of the cross-sectional variation in stock prices for ADR (i.e., CL) firms than for NCL firms is based on differences in financial-reporting environments rather than the additional disclosures provided by ADR firms, since ADR firms are not required to reconcile the largest difference between Mexican GAAP and U.S. GAAP, inflation accounting.

The discussant suggests that it would also be interesting to test for differences in the relevance of accounting information between the pre- and post-listing period for the ADR sample firms so that firms would serve as their own control, alleviating self-selection issues.

While we agree with the discussant that the more direct way to examine the effect of the information environment on the value relevance of ADR firms' accounting information is to examine the relation between earnings and book values and stock prices before and after cross listing, we are constrained by the lack of data in the pre-cross-listing condition. For example, the analyses in Table 5 provide univariate statistics for exchange-listed ADR firms before and after cross-listing. The number of firm-year observations ranges from 26 to 30. Regression results based on such data could only be viewed as descriptive. However, the results indicate that the relation between ADR book values and earnings is stronger after the firms cross list. The adjusted R^2 values increase almost monotonically as the firms approach cross-listing and are significantly larger after cross listing.

5. General

The discussant suggests that the paper's scope could have been expanded to look at the issue of Mexican firms' cross-listings from two additional perspectives. First, the determinants of the decision to cross list could have included explanatory variables in addition to leverage—for example, the size of the firm relative to the domestic market, the importance of the US product market, the percentage of shares held by US investors, the intention to get involved in M and A activity, etc. Second, the effects of cross listing (Hypotheses 2 and 3) could have been eliminated by performing longitudinal analysis on performance, relevance of accounting information, and perhaps cost of capital and liquidity effects.

Since our primary objective has been to investigate whether the ex post performance of Mexican cross-listed firms, based on accounting analysis, is consistent with the underperformance results documented in a variety of domestic and global offering/multi-country research studies, data availability prevents us from doing large sample before-and-after cross-listing tests (refer to the discussion related to Hypothesis 3), so instead we do a comparison of the performance of cross-listed versus non-cross-listed

firms. The underperformance result observed for Mexico is consistent with the results observed in the multi-country-sample studies.

The discussant suggests that we examine additional determinants of the decision to cross list, however, we are limited by available data. Based on the higher leverage observed for the cross-listed sample in comparison with the non-cross-listed firms, our results are consistent with a capital-constraint hypothesis. Our proxies for two additional determinants suggested by the discussant – relative size of the domestic market and importance of the US product market – were not significant in our tests. As far as we have been able to determine, data on percentage of shares held by US investors and indicators of “intention to get involved in M and A activity are not available.”

Finally, the discussant suggests that further longitudinal analysis of a variety of variables could have been performed. Again, we are constrained by the lack of available data and we are hesitant to draw conclusions from very small samples.

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An empirical investigation of trends in barter activity in the Russian Federation

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Abstract

Barter, which has dominated the Russian economic landscape for years, has significant economic and accounting implications. Barter often camouflages Russian businesses' financial and tax statements making true costs, prices, values, and profits a mystery, thereby compromising financial-statement transparency. Contemporary literature suggests that barter is still rampant in Russia.

For this study a group of Russian businesspersons were asked to complete a survey regarding the levels of barter in Russia since 1996. The empirical evidence we collected provides insight into recent trends in barter in Russia, including indication that the incidence of barter has dramatically decreased. These findings have significant implications for Russian business and economic development. A reduction in barter is likely to enhance financial-statement transparency, thus minimizing information risk for potential investors and creditors.

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Keywords: Barter; Russia; Financial transparency; Tax evasion

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1. Introduction, motivation and purpose

Barter² has dominated Russia's economic landscape for years and has significant implications for the country's future economic development and its ability to attract foreign investment (Aukutsioneck, 1998; Goldman, 1998; Makarov & Kleiner, 2000; Mardak, 2002; Van Schaik, 1998). Barter significantly affects and distorts the aggregate Russian economy. For example, barter embellishes prices, costs, and wages, impelling a cashless *virtual economy* (Brady, 1999; Ericson, 1999; Ericson & Ickes, 2001; Gaddy & Ickes, 1998a; Lindberg, 2002). Barter can be a detriment to the forces of supply and demand, and can create higher transaction costs (Commander, Dolinskaya, & Mumssen, 2000) while eroding the equilibrium pricing structure (Banerjee & Maskin, 1996; Yakovlev, 2000). Barter creates a barrier to exit for inefficient organizations by discouraging enterprise restructuring (Brady, 1999; Iakovlev, 2000; Ramey, 1992), by weakening enterprise competition, and can also lead to declines in output (Kim & Pirttila, 2004).

Barter is an accounting issue as well as an economic one. In the United States, APB Opinion No. 29 recognized the valuation and reporting problems related to such "nonmonetary transactions" (Accounting Principles Board, 1973). Without cash, barter transactions are easily hidden from view. Networking inherent in barter negotiation obfuscates market values (Enthoven, 1999; Ericson, 1999), hindering the ability of firms to measure their true costs and profitability because of misleading numbers (Bush, 1998; Enthoven, 1999; Ericson, 1999). Furthermore, barter clouds the financial position of a business, making it harder for investors and creditors to screen and investigate efficiently (Commander, 1999). Barter also increases risk for foreign investors by hindering time-series and cross-sectional analyses (Coker, 1999b; Coyle & Platonov, 1998; Enthoven, 1999; Higgins, 1998; Lindberg, Lindberg, & Razaki, 2000) and complicates internal and external monitoring of managers in particular and corporate governance in general by reducing accounting transparency (Commander, 1999; Defond & Hung, 2004; Guriev,

² While this manuscript defines barter as direct or commodity (pure) barter, some researchers utilize the term more broadly. Three definitions and related descriptions of barter and non-monetary exchange include (1) direct barter, (2) offsets (often called *Zachety* or *Vzaimozachot*); and (3) *veksels*. Lindberg (2002, p. 6) defines **direct** (or commodity) barter simply as "...an exchange of goods or services, or a settlement of an obligation, without the use of money as either a means of payment or a unit of account." Commander et al. (2000, p. 3) define direct barter as follows: "...goods are exchanged for goods, either bilaterally or in chains." Commander et al. (2000, p. 3) and Commander (1999, p. 19) state that **offsets** may involve exchanging debt for goods and are commonly "used to clear transactions among groups of firms; between firms and tax authorities; between firms and utilities or government." These non-monetary transactions may involve debt swaps and roll-overs (Commander, 1999, p. 19). According to Lobacheva (2003), settlements involving several entities without the use of cash are called *Vzaimozachot*, and this technique is often used because of general illiquidity issues. A third, common type of non-monetary exchange in Russia involves the use of **veksels**. Commander (1999, p. 19) defines *veksels* as promissory notes "issued by enterprises, banks or government with specific maturities and discount rates..." Goldman (1998) mentions that *veksels* are essentially IOUs from one enterprise to another. "Like barter, the *veksel* is designed to fill the void caused by the unavailability of cash, and is widely used not only by private businesses but by the government itself" (Goldman, 1998, p. 219). Additional information regarding Russian barter may be obtained from the University of Michigan's William Davidson Institute website: <http://www.wdi.bus.umich.edu/>.

Makarov, & Maurel, 2002). Barter is associated with Russian business tax evasion schemes and corruption that hamper the Federation's fiscal policy and tax collection system (Coker, 1999a; Enthoven, 1999; Halls, 1999; Lindberg, 2002; Moberg, 1998). Moreover, barter distorts accounting data, which compromises internal decision making (Commander, 1999), and consumes tremendous amounts of managerial time to arrange such transactions (Coyle & Platonov, 1998; Goldman, 1998).

1.1. Motivation and purpose

The preponderance of the Russian barter literature cited above suggests that barter rapidly increased during the 1990s, and predicts that it will not diminish anytime soon. It is noteworthy that a contrary view was presented by Russian Prime Minister Mikhail Kasyanov in his speech made to the Duma on May 15, 2002: "If in 1999 barter was about 40% of settlements, in 2000—25 percent, in 2001—16 percent, then in February 2002 we reached the lowest level of 12%" (Kasyanov, 2002). Similarly, a 2001 study conducted by the Center for Citizen Initiatives of their Russian program participants found only 20% of those surveyed currently used barter for receiving and making payments (Center for Citizen Initiatives, 2001).

Given barter's significant impact on the Russian aggregate economy, accounting transparency, and business stakeholders, such a declining trend would signal that Russia is indeed embracing a conventional market economy and may be poised to be an eventual contender in the global marketplace. Since the authors are unaware of any comprehensive, publicly available post-2000 empirical study of Russian barter that investigates the relationship between barter and business receipts as well as payments to suppliers, employees, and tax authorities, we are motivated to investigate barter-incidence trends in Russia. Consequently, the purpose of this study is to empirically assess trends in Russian barter since 1996, using data collected via a 2003 attitudinal survey of Russian businesspersons.

The remainder of this study is organized as follows. The next section presents the literature review and hypotheses of the study followed by the method and statistical results. The paper concludes with a discussion of implications pertaining to the empirical findings.

2. Literature review and hypotheses development

2.1. Data and theoretical framework to assess Russian barter trends

Data to empirically assess Russian barter generally come from two main sources, surveys, and archival data sources such as Goskomstat or information directly derived from business financial statements (Ivanenko & Mikheyev, 2002). Surveys provide an advantage in assessing Russian barter trends because specific information may be directly acquired from Russian businesspersons that is not otherwise obtainable publicly (Ivanenko & Mikheyev, 2002). Contemporary economic theory has been used to assess Russian barter trends, including neoclassical macroeconomics, and neoclassical microeconomics,

as well as evolutionary and neo-institutional approaches (Ivanenko, 2003; Makarov & Kleiner, 2000).

2.2. Why barter increased in Russia from 1992 through 1996: a threefold taxonomy

Iakovlev (2000, p. 82) asserted that the precipitous increase of barter in Russia during the 1990s was a function of the following three key factors: (1) scarcity of monetary capital; (2) tax evasion; and (3) businesses with high fixed costs that wished to avoid failure and restructuring. Other noteworthy scholars of Russian barter have suggested similar preconditions for the prevalence of Russian barter, although the exact terms vary. For example, Woodruff (1999, p. 143) espoused a “triple movement” towards barter composed of (1) an overall credit squeeze; (2) a way for otherwise failing firms to avoid restructuring (due to high fixed costs) (termed “barter of the bankrupt”); and (3) eventual government acceptance of barter through policies such as accepting in-kind payments for tax liabilities. Lindberg (2002, p. 13) provided a similar list of preconditions, including (1) tight economic policy and liquidity squeeze, (2) tax evasion, and (3) delayed restructuring (fixed costs). Commander et al. (2000, p. 5) enumerated four explanations for the abrupt 1990s increase in Russian barter: (1) liquidity and credit squeeze; (2) implicit governmental subsidies such as accepting in-kind payments for tax which reduced the pressure to restructure business; (3) rent seeking made possible by lack of financial transparency which fostered tax evasion; and (4) historical bartering relationships that dated to Soviet times.

Because each of the above preconditions for barter may be loosely categorized using Iakovlev’s (2000) three broad and parsimonious classifications, this review of literature is also organized using this threefold taxonomy. We will first assess literature that addresses the scarcity of monetary capital during Russia’s early economic transition that uses a backdrop of neoclassical macroeconomic theory that promulgates the “liquidity hypothesis” (Makarov & Kleiner, 2000). Second, we will review neoclassical macroeconomic- and microeconomic-based studies pertaining to Russian tax evasion and in-kind payments of tax as well as related accounting-transparency issues that spurred barter prevalence. Thirdly, we will highlight literature based on neoclassical macro- and microeconomic theory that discusses the fixed-cost structure of many Russian businesses that made barter an attractive means of survival while also enabling many firms to avoid much needed operational restructuring, which is part of the “virtual-economy hypothesis” (Ericson & Ickes, 2001; Guriev & Ickes, 2000; Krueger & Linz, 2002). Noteworthy changes in these three factors during the period 1996 to 2002 will provide the basis for our *a priori* hypotheses, since major political events and policy changes during this time had significant implications for financial markets in general (Ivanenko, 2003), and for barter activity in particular.

The literature suggests that Russian businesses were initially forced into barter in order to survive due to an exogenous liquidity crisis “shock” during the early to mid-1990s, which is addressed by the “liquidity hypothesis” (Iakovlev, 2000; Ivanenko, 2003; Linz & Krueger, 1998; Makarov & Kleiner, 2000). Subsequently, however, scholars suggest that barter became an endogenous deliberate-choice variable for firms, which partially explains the persistence of barter beyond the initial liquidity crisis. For example, some firms

continued to use barter because the related networking provided an institutional “support group” that created a barter “lock-in effect” (Guriev & Ickes, 2000; Makarov & Kleiner, 2000), which was exacerbated by significant networking entry and exit costs (Ould-Ahmed, 2003). Furthermore, the “virtual-economy hypothesis” suggested that failing, inefficient firms in need of significant operational restructuring were not allowed to fail by various levels of the government (Guriev & Ickes, 2000). The following sub-sections review the three broad factors that most scholars believe explain the rapid increase in Russian barter during the period 1992 to 1996.

2.3. Factor 1: the scarcity of monetary capital (1992 to 1996)

The economic shock of attempting to shift to an open market capitalist system from communism, combined with governmental policy that tightened the money supply, limited credit, and weakened the monetary system, plunged Russia into a vicious cycle of nonpayment during the 1990s (Commander & Mumssen, 1998; Coyle & Platonov, 1998; Ivanenko & Mikheyev, 2002; Knobel, 1994; Ould-Ahmed, 2003; Woodruff, 1999). Russia's communist heritage had already institutionalized barter in Russian businesses as a means of achieving Soviet targets, while the lack of cash exacerbated barter's hold on the country (Ericson & Ickes, 2001; Makarov & Kleiner, 2000). Russian barter increased in the post-Soviet era because of a fragile monetary system (Yakovlev, 2000). “(T)he mass borrowing of the government again artificially increased the demand for monetary capital, increased its opportunity cost, and made the repayment of monetary working capital to the real sector inefficient for production enterprises” (Iakovlev, 2000, p. 89). Mounting debts encouraged offset operations, which added to the growth of non-monetary transactions (Commander et al., 2000).

Generally, the banking system was underdeveloped and lacked financial transparency (Iakovlev, 2000; Kim & Pirttila, 2004). Lending by banks in the private sector declined sharply in the 1990s, causing a credit squeeze that essentially forced companies to use barter due to the tight money supply and associated liquidity constraints (Commander, 1999; Linz & Krueger, 1998). The lack of cash in Russia (Commander et al., 2000; Grimond, 1997; Van Schaik, 1998), due to poor monetization and unavailable credit, forced Russian businesses to engage in self-financing techniques that increased barter, offsets, and the use of veksel promissory notes (Ericson, 2000; Gedeon, 2000; Woodruff, 1999). Scholars have termed this general state of affairs as the “liquidity hypothesis” (Linz & Krueger, 1998; Makarov & Kleiner, 2000). More companies engaged in barter over time because of this scarcity of cash, leaving most companies unable to pay even their workers in rubles. Additionally, hyperinflation caused a lack of faith in the ruble (Lindberg, 2002; Woodruff, 1999).

2.4. Factor 2: tax evasion, in-kind payments of tax, and accounting transparency (1992 to 1996)

Barter compromised tax accounting in Russia and often surfaced as a means of tax evasion (Coker, 1999a; Enthoven, 1999; Halls, 1999; Hendley, Ickes, Murrell, & Ryterman, 1997; Iakovlev, 2000; Lindberg et al., 2000), which included schemes

involving hidden or “black cash” and sham companies (Yakovlev, 2001). Goldman (1998, p. 217) noted widespread tax evasion: “. . . out of 2.7 million companies that should pay taxes, 33 percent neither paid taxes nor filed tax declarations.” Goldman (1998, p. 217) added, “Of those that did pay taxes, one third used barter as a form of mutual settlements,” which signaled that even the Russian government used barter extensively in its own transactions.

Barter and related non-monetary settlement forms were essentially encouraged by local and central governments because tax authorities and public utilities regularly accepted payments in-kind (Commander et al., 2000). In a related vein, “the state’s reluctance to enforce timely cash payments for tax and utility, in part motivated by an unwillingness to let poorly performing firms fail, is central to understanding the growth and persistence of non-monetary forms of payments in Russia” (Commander, 1999, p. 20). This central government capitulation corresponded with Woodruff’s (1999) third stage of Russia’s triple movement towards a barter economy, and marks a distinct contrast with the Russian government’s initial fight against barter during the early 1990s. Barter accounted for at least 40% of Russia’s national tax payments towards the end of the 1990s (Lindberg et al., 2000, p. 157).

The onerous Russian tax system caused more businesses to use barter in order to evade a taxation system that most businesspersons considered arbitrary and grossly unfair (Black, Kraakman, & Tarassova, 2000; Woodruff, 1999). Lindberg (2002) and Linz (1996) concurred, noting that if firms actually paid all their state and local taxes they would likely owe more than two-thirds of total revenues (as opposed to total profits). The high levels of tax, the number of taxes, and the draconian enforcement policies utilized by the tax police are well-documented atrocities associated with the Russian business climate of the 1990s (Fleischman & Herz, 2002; Ivanenko, 2003). Because of this onerous tax system, business resorted to barter in order to survive (Gaddy & Ickes, 1998a). In short, Moberg (1998) argued that the tax problems in Russia’s barter economy of the 1990s were worse than Russia’s problem with crime and gang corruption. A corrupt legal system further stimulated barter’s renaissance (Coker, 1999b).

Linz and Krueger (1998) noted that financial transparency in Russia had been very poor because employers were reluctant to make financial statements available at all, and if they did, they often misrepresented the numbers. The lack of financial-statement transparency also played a role in encouraging barter. For example, because business financial information was so poorly disseminated and accounting standards were so lax, a situation of widespread information asymmetry arose where a business could promote apparent illiquidity even when ample cash existed in order to obtain barter exchange rather than having to transact in scarce cash (Guriev & Ickes, 2000). The lack of financial transparency fostered a lack of investor control over managers and thus compromised corporate governance (Guriev et al., 2002; Kim & Pirttila, 2004). This lack of financial-statement transparency inherent in barter enabled rent-seeking behaviors by managers and state bureaucrats which fostered “tax evasion and overpricing of goods in procurement, as well as distortions in the federal revenue-sharing system” (Commander et al., 2000, p. 5). This lack of transparency effectuated what Brady (1999), Ericson (1999), Gaddy and Ickes (1998a), and Lindberg (2002) referred to as the Russian *virtual economy* since it lacked validity in the sense that barter essentially overstated prices, sales, and wages. Barter also

created opportunities to impair corporate governance through fraud, which further compromised public capital markets (Black et al., 2000).

2.5. Factor 3: fixed costs and avoidance of operational restructuring (1992 to 1996)

Ideally, inefficient, unprofitable manufacturing firms will be encouraged by market forces to engage in cost cutting and operational restructuring of fixed plant and equipment through replacement and reinvestment which is deemed to be a key ingredient to firm survival (Linz, 1996) and enhances the pace of transition and related economic growth (Krueger & Linz, 2002). If such failing firms are unable to restructure in order to become more competitive, they likely will fail due to eventual financial collapse. However, the “virtual-economy hypothesis” (Ericson & Ickes, 2001; Krueger & Linz, 2002) partially explains why barter permitted many firms in Russia to avoid restructuring during the 1990s. For example, the second stage of Woodruff’s (1999, pp. 113–114) triple movement to a barter economy essentially described this virtual-economy hypothesis which he termed the “barter of the bankrupt”: “...rather than simply going out of existence, enterprises were able to convince key suppliers to accept payment in kind at effectively lower prices.” Woodruff’s (1999, p. 119) noted that local officials exacerbated the situation because they did not want firms to fail in their region because of the possibility of massive unemployment and related economic effects. Brady (1999, pp. 30–31) described industry’s reaction to the Russian government’s planned “painful restructuring of industry”: “...most factories hardly changed their behavior...producing and shipping as they always had...[and] made no effort to cut costs.”

Iakovlev (2000) argued that this economic phenomenon occurred in the Federation because many large Russian enterprises had a nontraditional cost structure (inherited from Soviet times) for a developed market economy because their fixed costs were unusually high. These fixed costs included maintenance of the social infrastructure, surplus equipment, production spaces, and even surplus labor (Iakovlev, 2000, p. 82). Maintenance of the social infrastructure could include payoffs associated with corruption (Brady, 1999) in order to increase relational capital with local government officials (Guriev & Ickes, 2000).

“The ‘fixed’ nature of these costs was in practice only a condition of a series of historically extant institutional limitations (the absence of a market for real estate and capital goods; the lack of development of the manpower market; the limitations on the sale of equipment at prices less than balance sheet value, etc.)” (Iakovlev, 2000, pp. 82–83). Therefore, there was not a positive link between costs and output, but rather an “atypical U-shape” with respect to average unit costs and output, which essentially created a barrier to exit for these inefficient firms (Guriev & Ickes, 2000; Iakovlev, 2000, p. 83). Indeed, a decline in production below a certain level led to an increase (rather than decrease) in average costs and there was also no compensation of a price increase for products sold (because of limited supply) due to the absence of a true market (Ivanenko & Mikheyev, 2002). These inefficient firms were thus able to survive via barter exchanges that were possible because of long-established internal markets due to networking arrangements (Commander et al., 2000), including the support of the local government that permitted

enterprises to save face and avoid much-needed restructuring in return for their own support of local officials (Brady, 1999).

In the virtual economy, businesses needed cash primarily to pay their workers (Brady, 1999). Russian businesses generally did not consider firing employees during difficult economic times or when excess business capacity existed due to declining demand, which rendered labor an essentially *fixed* cost (see, e.g., Iakovlev, 2000). For example, Russian businesses employed far more workers than was warranted by their output and labor in general exhibited low labor elasticities (Gaddy & Ickes, 1998b; Linz, 1996, 2002). During the early to mid-1990s, Russian businesses did not have the liquidity to pay their employees in rubles, so they resorted to barter as a means of paying in-kind wages. For example, a logging company paid its lumberjacks in tampons in the early 1990s (Knobel, 1994) while some Russian citizens paid for their coal with cars, office furniture, or holiday packages (Grimond, 1997). Workers who were paid in non-monetary commodities found it that much more difficult to leave the region, which eliminated their outside options (Friebel & Guriev, 1999).

2.6. *Estimates of trends in Russian barter prevalence. 1992 to 2002*

The above discussion highlights that most scholars agree barter gradually increased during the 1990s for the multitude of reasons presented. Table 1 presents a summary of Russian barter literature that explicitly offers estimates of the percentage of business transactions that involved barter since 1992, including the recent information that Prime Minister Mikhail Kasyanov mentioned in his speech to the Duma on May 15, 2002 (alluded to earlier regarding this manuscript's motivation). For purposes of comparison and parsimony, estimated barter percentages obtained from five interviews of prominent Russian businesspersons conducted by the authors in 2003 are also presented in the table.

All the studies listed in Table 1 pertaining to the preceding literature review highlighted that barter either increased during the 1990s or was at least a very significant percentage during that time. Few studies, however, presented barter estimates for years after 1999. The estimates of barter obtained from the 2003 interviews, along with the data from the CCI survey and the Kasyanov speech, however, suggested that barter started to decline in 1998, and continued to decline through the last year of the study, 2002.

2.7. *Development of hypotheses*

As enumerated in the above literature review, Iakovlev (2000, p. 82) asserted that the precipitous increase of barter in Russia during the 1990s was a function of the following key factors: (1) scarcity of monetary capital; (2) tax evasion; and (3) businesses with high fixed costs.

Conversely, if some or all of these key preconditions to barter prevalence reversed in later years, one would expect barter to decrease correspondingly. This section summarizes changes that occurred in Russia during the period 1996 to 2002 pertaining to each of these three key categories that should suggest that barter in Russia likely *decreased* during these years, probably after peaking in 1998 (Ivanenko & Mikheyev, 2002).

Table 1
Approximate Russian barter trends: 1992 through 2002

CITE/YEAR	Basis for measure ^a	1992– 1994	1995	1996	1997	Late 1990s; 1998	1999	2000	2001	2002
<i>Literature review</i>										
Hendley et al. (1997 p. 34)	A	5%		40%						
Goldman (1998 p. 218)	B					70–80%				
Van Schaik (1998 p. 2)	B					50%				
Bush (1998 p. 32)	A					40–45%				
Enthoven (1999 p. 35)	C					80%				
Woodruff (1999 p. 2)	A					50–70%				
Commander et al. (2000 p. 8)	A	10–20%	25%	40%	46%	50%	35%			
Yakovlev (2000 p. 279)	A					50%				
Lindberg et al. (2000 p. 157)	B					50%				
Makarov and Kleiner (2000 p. 54)	D	40%		75%	90%					
Center for Citizen Initiatives, (2001 p. 27)	B								20%	
Kasyanov Speech (2002)	B						40%	25%	16%	12%
<i>Author interviews in early 2003</i>										
Barilenko and Plotnikov (2003)	B					Starting to decline				20%
Knyazev (2003)	B					Starting to decline				10–15%
Lobacheva (2003)	B					Little in-kind Pay			In-kind pay now rare	
Makarov (2003)	B							Declining	10–15%	
Zhelihovskaya (2003)	B									15%

^a Basis for measure: A=Barter as % of sales; B=Barter as % of all business transactions; C=Barter as % of all transactions, includes setoffs; D=Barter as % of total production.

2.8. Changes in factor 1: the availability of monetary capital (1996 to 2002)

Russia emerged a stronger country economically after survival of the ruble crisis of 1998. In hindsight, it appears that the policies enacted during and shortly after the ruble crisis helped provide the “shock” that the Federation needed to re-establish itself monetarily, and this subsequent currency stability and liquidity, spurred by an increase in

aggregate demand (Commander et al., 2000), helped ease barter's recent stronghold on Russian business.

Specifically, the Russian government was able to initiate more stable policies regarding credit availability and monetization. Banks were more willing to extend credit and became more developed by Western standards. Inflation also stabilized, which further increased faith in the ruble. In essence, Woodruff's (1999, p. 217) prediction seemed to come true, since

“...Russia's chance to overcome its nonmonetary economy depends on its ability to stabilize its monetary economy.”

Additionally, Commander et al. (2000, p. 8) postulated that barter and related non-monetary transaction incidence started to decline after the 1998 ruble crisis, as corroborated by their estimate that the share of barter in industrial sales was about 50% in 1998 but only about 35% a year later (see Table 1). Specifically, there was a growth in barter transactions before the August 1998 ruble crisis and a subsequent decline thereafter (Commander et al., 2000). This decrease can “be partly explained by liquidity conditions in the enterprise sector: while enterprises were faced with scarce bank credit both pre- and post-crisis, liquidity was squeezed by the decline in aggregate demand for domestic goods before the crisis and rebounded as demand picked up after the crisis” (Commander et al., 2000, p. 28). Ivanenko and Mikheyev (2002) asserted that it is no coincidence that non-monetary trade has fallen in importance after the 1998 ruble crisis because the money markets started to operate better after this significant event. “The 1998 devaluation led to improvements in competitiveness and the liquidity position for Russian firms with a concurrent reduction in the use of barter” (Kim & Pirttila, 2004, pp. 300–301). These events should lead to a decrease in barter during the period 1996 to 2002.

2.9. Changes in factor 2: tax evasion, in-kind payments of tax and accounting transparency (1996 to 2002)

In response to the high level of barter in the business community, the Russian government addressed barter in the Tax Code as well as in the Civil and Labor Codes during the late 1990s and early 2000s (Civil Code of the Russian Federation: Parts 1 and 2, 2001; Labor Code of the Russian Federation of 31, 2001). The country is also reforming its accounting standards to increase financial transparency in accordance with international accounting standards (IAS).

The Tax Code of the Russian Federation (2000) now specifies cash as the acceptable means of settlement of tax payments as well as lien procedures for monetary accounts (Article 45) and maps a “step-by-step” approach for collection in the event a business or person cannot pay the entire tax obligation in cash (Articles 47 and 48). The steps begin with cash and move to securities and non-productive property payment forms before impacting resources necessary for the production process. The associated Tax Code instructions now call for the formal conversion of such property to cash since barter is no longer authorized as a means of tax settlement. The Tax Code further addresses barter transactions conducted by businesses, granting tax authorities the right to assess additional charges when barter exchanges deviate from more than 20% of the market price (Article 40).

In addition, the Federation radically reformed the business VAT and profits tax effective 1 January 2001 and 2002, respectively. Both taxes have been streamlined to make them more parsimonious and the profits tax rate has been cut from 35% to 24% (Fleischman & Herz, 2002). These business-tax changes, combined with a reform to the new 13% flat tax for Russian individual taxpayers that became effective 1 January 2001, mark a distinct shift from the tortured attempts at tax-revenue assessment and collection during the 1990s. The new, reformed tax systems focus on reducing the overall level of the tax burden and the sheer number of taxes that previously existed (Enthoven et al., 2001), and encouraging more systematic and fair tax collection policies as opposed to the “fear-driven” draconian collection procedures of the 1990s. The reformed tax and collection system is an attempt by the Russian government to encourage transparency of tax burdens while increasing perceptions of equity and fairness (Fleischman & Herz, 2002).

Russia is also reforming her accounting standards in order to encourage financial transparency, consistency, and fairness. A key goal of Russia’s accounting reform program is to align Russian accounting standards (RAS) with international accounting standards (IAS) (Enthoven et al., 2001), which should decrease information asymmetry (Leuz, 2003). Additionally, Russia is implementing sweeping changes to increase the integrity and competence of its approximately 60,000 professional accountants which is necessary to transition to IAS (Enthoven et al., 2001). In summary, these collective events should lead to a decrease in barter during the period 1996 to 2002.

2.10. Changes in factor 3: fixed costs and avoidance of operational restructuring (1996 to 2002)

Decreases in barter associated with changes to factors 1 and 2 above likely impact the inherent fixed-cost nature of industrial Russia which had inadvertently established a barrier to exit for unprofitable firms. For example, reduced barter incidence in Russia should enhance the relevance of market values (Enthoven, 1999; Ericson, 1999), prices (Banerjee & Maskin, 1996), and supply-and-demand equilibrium (Commander et al., 2000). These trends should correspondingly lessen the former institutional-market limitations (Iakovlev, 2000) that had obfuscated the link between costs and output and should reintroduce marginal profits for price increases associated with limited supply products as well as cost decreases for reductions in production. Costs that were essentially fixed because of the former U-shaped cost-to-output relationship may now exhibit variable cost behavior in relation to output because of this enhanced market efficiency. Ultimately, these directions should mitigate barriers to exit and operational restructuring for failing firms by enhancing enterprise competition and innovation (Brady, 1999; Commander et al., 2000; Iakovlev, 2000; Woodruff, 1999, 2000).

Labor cost has traditionally been a fixed cost for practical purposes in Russia because employees viewed work as a place to spend time rather than a place to be concerned with efficiency and output (see, e.g., Brady, 1999; Iakovlev, 2000). However, labor-hiring practices have changed in recent years in Russia and anecdotal evidence (Barilenko & Plotnikov, 2003; Knyazev, 2003; Lobacheva, 2003; Zhelihovskaya, 2003) suggests that many enterprises wish to hire workers who are younger than 30 because they tend to have a more western attitude towards the relationship between work and productivity. This trend

indicates that labor may now exhibit variable-cost tendencies, reducing the fixed-cost nature of Russian firms that has inhibited restructuring.

In summary, it appears that Woodruff's (1999) triple movement that was a theoretical precursor to rapid increases in Russian barter is now abruptly changing. For example, enhanced credit and liquidity and the central government's recent legislative onslaught against barter associated with in-kind tax payments and wage payments to employees³ signal that the first movement (credit squeeze or "liquidity hypothesis") and the third movement (central government encouragement of barter) have reversed. The reintroduction of market factors described above combined with a lessening of the fixed-cost structure also likely mitigate Woodruff's (1999) "barter of the bankrupt" (second movement) which is associated with the "virtual-economy hypothesis." Furthermore, the central government's Herculean attempts to minimize barter puts added pressure on local governments to discontinue encouraging barter in order to sustain local failing industry. Ultimately, it appears that inefficient, failing industrial firms will have to choose between restructuring their operations and processes versus going out of business, since the barter "crutch" is being removed due to enhanced market competition, changing cost structures, and central government discouragement of non-monetary exchange.

This recent downward trend in barter incidence suggests the following hypotheses:

H_{a1}. Barter activity in Russia decreased during 1996 to 2002.

Specifically, because of the overall downward trend in barter, we also expect that (1) the percent of total Russian business receipts and payments (overall measure) settled by barter have decreased during this time period. We also expect a corresponding decrease in (2) barter as a percent of receipts from customers, as well as (3) barter as a percent of payments to suppliers, and (4) barter as a percent of payments for equipment, because these dealings represent the core business transactions discussed in the literature review. We also expect on an *a priori* basis the following decreases during 1996 to 2002: (5) barter as a percent of payments for employee salaries (due to changes in the labor law, added liquidity, and aggregate demand), and (6) barter as a percent of payment for taxes (in-kind settlements are now essentially banned by the new tax code). These contentions are formalized as sub-hypotheses 1a through 1f:

H_{a1a}. The percent of total Russian business receipts and payments settled by barter decreased during the period from 1996 to 2002.

H_{a1b}. The percentage of receipts from customers settled by barter decreased during the period from 1996 to 2002.

H_{a1c}. The percentage of payments to suppliers settled by barter decreased during the period from 1996 to 2002.

H_{a1d}. The percentage of payments for equipment settled by barter decreased during the period from 1996 to 2002.

³ For example, even with employee authorization, the Labor Code (2001) restricts the amount of non-monetary payment to 20% (Article 131).

H_{a1e}. The percentage of payments of employee salaries using in-kind non-cash methods decreased during the period from 1996 to 2002.

H_{a1f}. The percentage of payments for taxes settled by barter decreased during the period from 1996 to 2002.

Finally, because of shifts in the Russian business climate since 1999, one would expect that the use of barter among Russian businesses may be for different reasons in 2002 as compared to 3 years prior (1999) when these above changes first started to take affect and to be discussed and experienced by the Russian people. This contention is formalized as follows:

H_{a2}. The purpose and use of barter activity in Russia has changed during the 1999 to 2002 time period.

Specifically, barter is less likely to be used to obtain a better exchange price on a sale or purchase in 2002 as compared with 1999 because of the Russian government's explicit discouragement of barter transactions in general. Russian businesses are also less likely to use barter in 2002 to compensate for a lack of cash, to hide profits, or to avoid taxes as compared with 1999. Cash and credit became more available in 1999 after the ruble crisis of 1998, accounting standards were being transformed to make financials more transparent, and the tax system was radically transformed in 2001 and 2002. The following sub-hypotheses reflect these *a priori* contentions:

H_{a2a}. Russian businesses were less likely in 2002 to use barter to obtain a better exchange price on a sale or purchase as they were in 1999.

H_{a2b}. Russian businesses were less likely to use barter in 2002 to compensate for a lack of cash as compared to 1999.

H_{a2c}. Russian businesses were less likely to use barter in 2002 to hide profits as compared to 1999.

H_{a2d}. Russian businesses were less likely to use barter in 2002 to avoid taxes as compared to 1999.

The following section presents a summary of the study's data-collection process, including interview and survey data-collection procedures and survey scale development, followed by a discussion of our empirical findings. The final section of the study discusses the implications of the results as well as the study's limitations and suggestions for future research.

3. Method

3.1. Data collection

The authors queried opinions of Russian businesspersons about barter in Russia to test the working hypotheses enumerated immediately above using two separate and distinct

data-collection techniques: (1) five prominent businesspersons were interviewed personally by one of the authors; and (2) a short questionnaire regarding barter was used to query 99 other respondents regarding barter activity in Russia during the 1996 to 2002 time period. The results of the personal interviews are presented in Table 1.⁴

One of the authors, who traveled to Russia, hired a Russian national certified as an interpreter to translate the above survey from English to Russian, and a number of Russian professors and businesspersons comprehensively reviewed the survey for clarity and accuracy as a pilot study. Because anecdotal evidence suggests that Russian people are generally skeptical after the Soviet experience, the authors deemed it necessary to hire four Russian nationals with considerable business experience and professional contacts to personally administer the surveys. Consequently, the four Russian survey administrators were able to (1) explain the purpose of the survey in a personable and unbiased manner to minimize demand effects; (2) answer subjects' questions in an unbiased fashion⁵; (3) encourage subjects to complete the survey; and (4) reassure respondents that their answers were anonymous.⁶ Altogether the four nationals obtained 99 surveys from Russian businesspersons during the first 6 months of 2003.

⁴ The five Russian interviewees were: (1) Ilya Knyazev, a professional accountant in Saratov, Russia; (2) Natalya Zhelihovskaya, a Saratov entrepreneur and small business owner; (3) Vladimir Barilenko and Victor Plotnikov, who are both professional accountants and professors at Saratov State Socio Economic University; (4) Sergei Makarov, Professor of Civil Law at Saratov State University; and (5) Alina Lobacheva, an instructor and medical doctor at the Saratov Medical University. These five interviewees were selected because of their prominent positions in Russian business and society. The authors believed that these key members of society would be familiar with significant changes, if any, in the Russian barter landscape. These persons did not also participate in the formal questionnaire.

⁵ The Russian business people who administered the surveys for us were extensively trained to conduct interviews in a manner that should minimize demand effects and they did not discuss their personal beliefs with the subjects.

⁶ As mentioned in footnote 2 above, there are three key definitions of non-monetary exchange, although most of the literature blithely assumes that Russian barter refers to non-monetary exchanges of goods (direct or commodity barter). Researchers who are more concerned with barter definitional nuances are usually careful to distinguish barter from offsets and veksel's. However, because the authors believed that explicitly discussing possible definitions of barter would lengthen the time it would take for subjects to complete the questionnaire and increase confusion, thus further complicating the data gathering process, no explicit definition was mentioned. Therefore, it is possible that respondents included offsets and/or veksel's in their personal definition of what comprises barter when completing the survey. However, even if there was some variance in the respondent's definitions of barter, the trend in barter over time should be robust since each respondent answered the longitudinal questions in the survey using his/her same personal classification of barter, which created a built-in within-subject definitional control. Therefore, the study's conclusions regarding overall trends in barter are not likely to be severely compromised, although the absolute percentages of barter activity on a year-by-year basis may include some business activity associated with offsets or veksel's, necessitating interpretive caution.

⁷ The authors paid the four Russian nationals US\$6 for each businessperson who completed the questionnaire, as well as additional money for out-of-pocket items such as copying and mailing fees as well as travel and meal costs, for a total cash outlay of approximately \$1000 US. The four nationals were encouraged to travel to different Russian cities in order to increase the external validity of the study. Some subjects did not answer all the survey questions because apparently they were unsure about some of the particular questions on the survey. The surveys were then sent back to the United States for data input and analysis.

3.2. Survey scale development

The authors employed a number of different scale formats when designing survey questions to query respondents about their opinions regarding barter trends in Russia. Subject responses to these questions form the basis for assessing the validity of our working hypotheses, which is subsequently discussed.

For Hypotheses 1a–1f, subjects were asked to specify the percentage of barter associated with the specified barter activity pertaining to *firms similar to that of the respondent* for three time periods: 1996, 1999, and 2002. The authors believed that asking such detailed, quantitative questions would be appropriate only if they pertained to business activity with which the businesspersons would likely be intimately familiar.

Initially, the authors designed the survey to ask each respondent to address the level of barter “in the firm where you are employed.” However, during field testing it became apparent that such a question would act as a cultural trigger and arouse suspicion that the survey was fishing for answers for the government that could bring trouble to the respondents’ firms. The result might be refusal to participate in the survey or deliberate falsification of information. The Russians who participated in field testing suggested changing the phrasing to ask about the level of barter “in firms similar to yours.” These Russians reasoned that the subjects would now be truthful in their answers but would likely still be reporting the amount of barter in their own firms, since their own businesses would be the only organizations about which they would have such direct knowledge.

Finally, for Hypotheses 2a–2d, subjects were asked to evaluate stated reasons why Russian businesses in general use barter in 2002 versus “3 years ago” (1999) using a 7-point Likert scale anchored by 1 (strongly disagree) and 7 (strongly agree).

4. Results

4.1. Results of the businessperson surveys

In addition to providing a summary of barter percentages suggested in the preceding literature review, Table 1 also provides a summary of the trend in barter incidence suggested by the five prominent businesspersons (or group of businesspersons) interviewed by the authors in 2003. These interviews corroborated the generalization of a recent downward trend in barter suggested by Kasyanov (2002) in his speech to the Duma. Knyazev (2003) and Barilenko and Plotnikov (2003) stress that barter declined significantly after the devaluation of the ruble in 1998. Makarov (2003) estimates that barter in Russia declined substantially in recent years, and probably now comprises only 10–15% of business transactions, consistent with Zhelihovskaya’s (2003) suggestion of 15% and Barilenko and Plotnikov’s (2003) approximation of less than 20%. Lobacheva (2003) comments that in-kind wage payments in lieu of cash declined significantly after the 1998 crash of the ruble and are now very rare.

4.2. Sample characteristics

Table 2 provides descriptive demographic statistics regarding the study's 99 subjects. The average age was just over 41 and the average salary was slightly less than RUR 136,000 (approximately US\$4500). Subjects on average had worked for their current employer for about 11.5 years and had worked in their present occupation for almost 15.5 years. Almost 59% of the subjects were female, and most (over 70%) were married; just over 16% were separated or divorced. All but 5% of the respondents had graduated from secondary school and almost 65% had some university training, while over 20% were university graduates. All the respondents were white and almost 56% worked in accounting/finance, while fewer than 13% were managers and 14% were marketers/salespersons.

Table 3 provides a summary of organizational characteristics. About 35% of respondents indicated that they worked in manufacturing/construction while another 26% noted that their industry was wholesale/retail. About 77% of respondents indicated that they worked for businesses with fewer than 200 employees and over 85% of respondents' firms were located in the South Volga region of Russia.

Table 2
Sample characteristics

Variable	Category	<i>M</i>	<i>SD</i>	Frequency	Validity (%)
Age		41.46	9.71		
Gross salary		RUR 135,817	185,230		
		US \$4,527	\$6,174		
Job tenure (years)		11.56	8.00		
Occupational tenure (years)		15.40	8.88		
Gender	Male			40	41.2
	Female			57	58.8
Marital status	Single			9	9.2
	Married			69	70.4
	Widowed			4	4.1
	Separated, divorced			16	16.3
Education level	Some secondary school			0	0
	Graduated secondary school			5	5.2
	Some university			63	64.9
	Graduated university			20	20.6
	Some post-university or graduate degree			9	9.3
Race	Black			0	0
	Hispanic			0	0
	Oriental/Asian			0	0
	White			99	100
Job classification	Management			12	12.9
	Marketing/sales			13	14.0
	Accounting/Finance			52	55.9
	Other			16	17.2

Table 3
Organization characteristics

Variable	Category	Frequency	Validity (%)
Industry classification	Wholesale/retail	24	26.1
	Manufacturing/construction	32	34.7
	Services	8	8.7
	Accounting	11	12.0
	Advertising and marketing research	2	2.2
	Other	15	16.3
Number of employees	Fewer than 10	9	9.1
	10 to 29	23	23.2
	30 to 49	8	8.1
	50 to 99	9	9.1
	100 to 199	27	27.3
	200 or more	23	23.2
Geographic region	Moscow	5	5.2
	Saint Petersburg	1	1.0
	North Volga	5	5.2
	South Volga	83	85.5
	Other	3	3.1

4.3. Analysis of hypotheses

Table 4 presents the results of repeated measures analysis of variance (ANOVA) *F*-test procedures to test within-subjects contrasts as well as paired *t*-tests relating to Hypotheses 1a–1c, where subjects were asked to compare various forms of barter activity as a percentage of overall business activity for firms similar to the respondent's during 1996, 1999, and 2002. The percent of total Russian business receipts and payments settled by barter decreased during this time period (approximate mean percentages: 2002 $M=14\%$; 1999 $M=39\%$; 1996 $M=62\%$) and all differences were statistically significant ($p<.001$), providing strong support for Hypothesis 1a. Hypothesis 1b was similarly supported, given that respondents indicated a significant decrease ($p<.001$) in the percent of receipts from customers settled by barter (approximations: 2002 $M=9\text{--}10\%$; 1999 $M=23\text{--}26\%$; 1996 $M=46\%$). The percent of payments to suppliers settled by barter also decreased ($p<.001$) (approximations: 2002 $M=8\text{--}10\%$; 1999 $M=22\text{--}26\%$; 1996 $M=46\%$), which supports working Hypotheses 1c. All repeated measures ANOVA *F* statistic within-subject contrasts were significant ($p<.001$), with partial eta squared explanation of variance figures ranging from a low of .459 to a high of .815.

Table 5 provides results for Hypotheses 1d–1f that are almost identical to those contained in the previous table. The percent of payments for equipment settled by barter (approximations: 2002 $M=2\%$; 1999 $M=10\text{--}13\%$; 1996 $M=29\%$) significantly decreased over time ($p<.001$), providing substantial support for Hypotheses 1d. Similarly, the percent of payments of employee salaries and payments for taxes settled by barter decreased substantially ($p<.001$) during this time period, providing support for Hypotheses 1e and 1f. All repeated measures ANOVA *F* statistic within-subject contrasts were again significant ($p<.001$), with partial eta squared explanation of variance figures ranging from a low of .257 to a high of .522.

Table 4

Hypotheses 1a–1c paired *t*-tests/repeated measures ANOVA

Hypothesis pair/year	<i>M</i>	<i>SD</i>	<i>N</i>	<i>t</i>	<i>F</i>	Partial eta squared
<i>H_a1a: The percent of total Russian business receipts and payments settled by barter decreased during the period from 1996 to 2002.</i>						
2002	14.34	16.08	94	17.633***	310.925***	.770
1999	38.73	19.65	94			
2002	14.38	16.49	88	19.545***	382.021***	.815
1996	62.51	22.28	88			
1999	39.25	19.90	87	12.474***	155.602***	.644
1996	62.71	22.33	87			
<i>H_a1b: The percent of receipts from customers settled by barter decreased during the period from 1996 to 2002.</i>						
2002	9.27	15.23	87	9.108***	82.955***	.491
1999	23.37	22.94	87			
2002	10.05	15.75	71	11.462***	131.373***	.652
1996	46.31	32.43	71			
1999	26.25	23.71	71	9.610***	92.352***	.569
1996	46.31	32.43	71			
<i>H_a1c: The percent of payments to suppliers settled by barter decreased during the period from 1996 to 2002.</i>						
2002	8.07	16.16	89	8.644***	74.713***	.459
1999	21.99	22.26	89			
2002	9.98	18.13	67	10.071***	101.430***	.606
1996	45.79	32.04	67			
1999	25.97	23.52	68	8.123***	65.990***	.496
1996	46.15	31.93	68			

For *H_a1b* and *H_a1c*, respondents were asked to estimate the barter percentage associated with firms *similar to theirs* while *H_a1a* asked for barter estimates for a typical business in Russia.

Due to surveys with some unanswered questions, matched-pairs statistics result in slightly different averages for the same years.

*** $P < .001$.

Table 6 summarizes the results pertaining to the four parts (*Ha2a–Ha2d*) of the second hypotheses. Subjects were asked to rate their agreement/disagreement regarding four business reasons to engage in barter using a 7-point Likert scale, and were also asked to compare the situation in 2002 versus 3 years earlier (1999). The evidence suggests that subjects do *not* believe there was any significant difference ($\alpha=.10$) in 2002 versus 1999 regarding the propensity to use barter to obtain a better exchange price on a sale (2002 $M=3.99$; 1999 $M=4.12$), which is inconsistent with working Hypothesis 2a. Upon further reflection, this result should not be too surprising, since one would expect that a firm would always try to get the best price possible even if barter were necessitated for purposes of profit maximization. Conversely, businesses are significantly ($p<.001$) less likely to use barter in 2002 to compensate for a lack of cash as compared with 3 years earlier (2002 $M=5.02$; 1999 $M=6.39$), which provides strong support for working Hypothesis 2b. Neither Hypothesis 2c nor 2d were supported, however, since Russian businesses are not significantly less likely in 2002 to use barter to either hide profits or avoid taxes as compared with 1999. It should be noted that the negative connotation of Hypotheses 2c and 2d, hiding profits and evading taxes, may have affected the

Table 5
Hypotheses 1d–1f paired *t*-tests/repeated measures ANOVA

Hypothesis pair/year	<i>M</i>	<i>SD</i>	<i>N</i>	<i>t</i>	<i>F</i>	Partial eta squared
<i>H_a1d: The percent of payments for equipment settled by barter decreased during the period from 1996 to 2002.</i>						
2002	1.76	4.77	78	5.395***	29.104***	.274
1999	10.27	15.31	78			
2002	2.07	5.39	54	6.539***	42.757***	.447
1996	29.00	31.18	54			
1999	13.65	17.45	57	6.481***	42.022***	.429
1996	29.23	30.82	57			
<i>H_a1e: The percent of payments of employee salaries using in-kind non-cash methods decreased during the period from 1996 to 2002.</i>						
2002	4.22	11.10	87	6.951***	48.314***	.360
1999	15.79	20.88	87			
2002	4.55	11.66	78	9.178***	84.231***	.522
1996	29.85	26.80	78			
1999	16.65	21.35	78	6.756***	45.645***	.372
1996	30.29	27.34	78			
<i>H_a1f: The percent of payments for taxes settled by barter decreased during the period from 1996 to 2002.</i>						
2002	2.32	5.68	81	5.265***	27.716***	.257
1999	9.15	14.19	81			
2002	2.03	4.83	61	5.695***	32.429***	.351
1996	20.70	27.31	61			
1999	9.93	14.78	60	5.453***	29.732***	.335
1996	19.72	26.42	60			

For *H_a1d* through *H_a1f* above, respondents were specifically asked to estimate the barter percentage associated with firms similar to theirs.

Due to surveys with some unanswered questions, matched-pairs statistics result in slightly different averages for the same years.

*** $P < .001$.

responses received from subjects. The following section discusses implications of these findings.

5. Implications and conclusions

The results strongly support all six parts of Hypothesis 1 (overall barter decrease during 1996 to 2002) and one of the four parts pertaining to Hypothesis 2 (the purpose and use of barter changed during 1996 to 2002). Furthermore, the interviews that the authors conducted of Russian businesspersons also strongly support the decrease in barter incidence during 1996 to 2002 espoused by Hypothesis 1.

Generally, the analyses in Tables 4 and 5 indicate that there has been a dramatic downturn in the use of barter in the Russian Federation between 1996 and 2002. For example, the study's subjects indicate that the percent of business receipts and payments settled by barter in firms similar to theirs has fallen from about 62% in 1996 to 14% in

Table 6

Hypotheses 2a–2d paired *t*-tests/repeated measures ANOVA

Hypothesis pair/Year	<i>M</i>	<i>SD</i>	<i>N</i>	<i>t</i>	<i>F</i>	Partial eta squared
<i>H_a2a: Russian businesses were less likely in 2002 to use barter to obtain a better exchange price on a sale or purchase as they were in 1999.</i>						
2002	3.99	1.92	89	0.888	0.789	.009
1999	4.12	2.13	89			
<i>H_a2b: Russian businesses were less likely to use barter in 2002 to compensate for a lack of cash as compared to 1999.</i>						
2002	5.02	2.06	96	7.215***	52.055***	.354
1999	6.39	0.93	96			
<i>H_a2c: Russian businesses were less likely to use barter in 2002 to hide profits as compared to 1999.</i>						
2002	2.89	1.70	89	0.096	0.009	.000
1999	2.88	1.72	89			
<i>H_a2d: Russian businesses were less likely to use barter in 2002 to avoid taxes as compared to 1999.</i>						
2002	2.77	1.73	90	0.127	0.016	.000
1999	2.76	1.79	90			

A 7-point Likert scale was employed to measure respondent attitudes, where:

1=strongly disagree that barter is used today (3 years ago) to ____.

4=ambivalent that barter is used today (3 years ago) to ____.

7=strongly agree that barter is used today (3 years ago) to ____.

*** $P < .001$.

2002; while barter payments from customers have declined from about 46% to only 9% during this same time period. Similar trends during these years are found regarding barter payments to suppliers, which have fallen from about 46% to 8%, as well as barter payments for equipment and employee salaries, which have fallen from about 29% to less than 5% in both cases.

Specifically, if the businesspersons interviewed by the authors are correct (see Table 1) and considering Commander et al. (2000), barter probably peaked somewhere around the ruble crisis of 1998, and then started to decrease thereafter. These conclusions are noteworthy, given that they are not consistent with the preponderance of literature addressing Russian barter that suggests Russian barter is not only as widespread as ever, but is still likely on the rise (Commander, 1999; Coyle & Platonov, 1998; Enthoven, 1999; Lindberg, 2002; Makarov & Kleiner, 2000; Van Schaik, 1998; Woodruff, 1999; Yakovlev, 2000). Indeed, these findings have implications for the economic future of the Russian Federation, as discussed subsequently.

Table 6 provides some surprising empirical evidence, which is not consistent with the majority of recent literature pertaining to Russian barter. For example, a number of researchers suggest that barter is associated with tax evasion, and some authors suggest this may also involve purposely hiding and/or camouflaging accounting profits (Black et al., 2000; Goldman, 1998; Iakovlev, 2000; Lindberg, 2002; Moberg, 1998; Van Schaik, 1998; Yakovlev, 2001). The subjects in our study, however, indicated that there were no differences between the ways the Russian businesses used barter in 1999 as compared with 2002 with respect to hiding profits (2002 $M=2.89$, vs. 1999 $M=2.88$) or avoiding taxes

(2002 $M=2.77$, vs. 1999 $M=2.76$). Although these results may reflect a phenomenon of only the previous few years, a minority group of scholars (Commander, 1999; Linz & Krueger, 1998; Yakovlev, 2000) have also argued that barter is not a significant component of evasion and/or hiding profits.

A review of the 2002 mean barter percentages contained in Tables 4 and 5 suggest that barter is more likely associated with business receipts and payments (2002 $M=14\%$) and is least likely associated with payments for equipment (2002 $M=2\%$), taxes (2002 $M=2\%$), and employee salaries (2002 $M=4\frac{1}{2}\%$). It appears that the days of the late 1990s, when employers paid their employees with vodka, cars, tea sets and tampons, are essentially over. These mean percentages based in Tables 4 and 5 are very consistent with the Table 1 2003 interview data, including the percentages that Prime Minister Mikhail Kasyanov enumerated in his 2002 speech, that suggested that barter percentages in general are now well below 20%.⁸ In addition, if barter in Russia is below 20%, this level is consistent with the approximate 20% barter international norm for commerce espoused by Mardak (2002).

As highlighted in the hypotheses development earlier, reform of the Tax, Civil, and Labor Codes of the Russian Federation might offer some explanations for the decline in barter. First, cash, liens, and orderly liquidation of business assets are clearly defined as the means of tax settlement, replacing the possibility of in-kind barter exchanges. Second, although barter and offset exchanges are viewed as a legal means of transactions between businesses, tax bodies are given the authority to question barter transactions that deviate too far from fair market exchanges, discouraging businesses from indulging in barter to distort taxable income or gain unfair profit advantages. Finally, new laws limiting the rights of employers to utilize barter in lieu of cash salary appear to have been effective in curbing these practices (Lobacheva, 2003).

The apparent decrease in barter has significant implications regarding the direction of the Russian economy as a whole. For example, free market price equilibrium should start to emerge in Russia, freeing the forces of supply and demand and the concept of value. Transaction costs should decrease and managerial time should be freed from barter negotiation to focus on the efficiency and productivity of the enterprise. Additionally, Russian company financial statements should become more transparent, allowing for investor and creditor monitoring of corporate governance. Investment risk should generally decrease, increasing the possibility that overseas investment might flow into the country and further energize the Russian economy.

Widespread decreases in barter incidence should sever interfirm relationships that undermine competition and innovation and mitigate artificial demand for goods that may not otherwise be competitive (Commander et al., 2000). Finally, inefficient enterprises formerly artificially buoyed by barter will be allowed to fail, increasing "allocative and dynamic efficiency" in the Russian economy (Commander et al., 2000, p. 23).

It is noteworthy that this trend of decreasing barter proclivity is accompanied by the Russian government's significant reform of its tax structure during the past 2 years. Morozova and Arnett (2001, p. 10) argue that the former Russian tax structure contributed to Russia's economic lack of transparency because of the "large number of taxes, high

⁸ This percentage is now consistent with the approximate 20% barter international norm for commerce espoused by Mardak (2002).

effective rates of tax, bureaucratic inefficiency and inadequate or non-existent judicial controls over the tax authorities.” The Russian government has radically reformed the tax structure by reducing effective tax rates, substantially minimizing the number of different business taxes, and creating a tax monitoring system that is more equitable and less draconian (Fleischman & Herz, 2002). We expect that a more fair and streamlined tax system will enhance economic and financial transparency and reduce remaining incentives to use barter to hide profits from the tax authorities. These changes should also assist foreign investors in calculating the true cost of investing in Russia (see, e.g., Fleischman & Herz, 2002; Khanna, Palepu, & Srinivasan, 2004; Young & Guenther, 2003) and will likely assist the metamorphosis of the Russian financial statement towards international accounting standards (IAS), which should reduce information asymmetry (see, e.g., Leuz, 2003; Lindberg, 2002). Indeed, it appears that Russia may be at the threshold of a 21st century economic renaissance.

This manuscript adds to the empirical Russian barter literature in a number of significant ways. In addition to a comprehensive review and synthesis of the literature and related economic theory, the study uses a survey to query Russian businesspersons regarding significant barter issues that are not addressed in any other publication that we are aware of. For example, this research investigates trends in Russian barter during 1996 though 2002 pertaining to business receipts, as well as payments for equipment, employee salaries, taxes, and payments to suppliers. The study also empirically investigates contemporary trends in Russian barter pertaining to its use to obtain a better purchase price, to compensate for a lack of cash, to hide profits, and to avoid taxes, which furthers our understanding of Russian business operations.

While the results of this study are intriguing and noteworthy for the future of the Russian Federation’s economic development, we must note the limitations of the study. The study’s sample is relatively small, and hails primarily from a uniform geographical location that lacks ethnic diversity, so generalizing the results to other Russian regions, non-business professions and ethnic groups is difficult. The authors did attempt to minimize same source data bias by utilizing a written survey as well as personal interviews, but most of the data was obtained from the written survey source. Further, the mean barter percentages presented may not solely represent direct or commodity barter activity since they may also include other forms of non-monetary exchange such as offsets and veksels, which are discussed in footnote 2.

Future research should explore the relationship between barter incidence and recent tax reform. Further, researchers should investigate recent barter trends in Russia using information obtained from other professions and non-professional citizenry, and by using different data-collection methodologies. It would also be helpful to explore changes in Russian monetary policy, banking and credit, productivity, gross domestic output, and foreign investment over time in relation to barter incidence.

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Ownership structure, contingent-fit, and business-unit performance: A research model and empirical evidence[☆]

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Abstract

This study investigates the influence of contingent-fit on the relationship between ownership structure and business-unit performance. We predict that contingent-fit between business strategy and its contextual variables will have a positive relationship with business-unit performance. We also predict that widely-held companies will perform better than their closely-held counterparts but that the magnitude of the performance differential will decrease with the increasing level of contingent-fit.

Overall, the results are consistent with our predictions. We found that contingent-fit is positively related to business-unit performance and widely-held business-units perform better than their closely-held counterparts. The performance advantage, however, was mitigated by the level of contingent-fit.

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Keywords: Ownership structure; Strategic orientation; Contingency theory; Business-unit performance

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1. Introduction

Ownership structure—the relative amounts of ownership claims held by management and investors has traditionally dominated research in accounting, particularly research using the agency approach. Under conventional views of agency costs, an increase in management's stake in the firm should lead to an alignment of managers' and other shareholders' interests and, therefore, lead to shareholder-wealth creation. Studies have found, however, that concentrated ownership, especially when the controlling shareholder is either an individual or a family member, will have a negative impact on a company's performance (Gilles, 1999; Mahaffy, 1998).

The purpose of this study is to investigate the influence of contingent-fit on the relationship between ownership structure and business-unit performance. Using a contingency approach, we define fit as the proper match between the firm's strategic orientation and its structure (Bruns & Waterhouse, 1975; Gordon & Miller, 1976; Otley, 1980; Ouchi, 1977) and measure this construct based on the weighted sum of the fit contribution of each contextual variable as proposed by the fitness landscape theory. Furthermore, we measure business-unit performance by the relative importance of the following variables: return on investment, profit, cash flow from operations, cost control, development of new products, sales volume, market share, market development, and personnel development (Chenhall & Langfield-Smith, 1988; Govindarajan, 1988).

Previous studies have found a positive association between fit and performance (Chenhall & Langfield-Smith, 1988; Moores & Yuen, 2001). The existing studies, however, have focused their investigation on widely-held companies. We are not aware of studies that have looked at this phenomenon in closely-held companies to determine whether the pattern found in widely-held companies also exists in closely-held companies, despite their different characteristics.

Five main characteristics distinguish closely-held companies from their widely-held counterparts. First, closely-held companies are owned by a limited number of shareholders who often are family members or a group of entrepreneurs who started the venture. Second, their stocks are not actively traded on an established market or held widely enough to be subject to the disclosure requirements and oversight of securities regulators. Consequently, closely-held companies tend to face fewer regulatory and disclosure requirements. Third, closely-held companies tend to develop systems and procedures that are heavily influenced by their entrepreneurial owners. Fourth, owners of closely-held companies often have a larger stake in the firm than owners of widely-held companies, which suggests that shareholders of closely-held companies tend to be less risk-neutral than shareholders of a widely traded company. Studies have shown that the less risk-neutral the principal, the more likely risk will be shared with the agent through outcome-contingent compensation such as a bonus plan to align the interests of the owner and the manager (Ang, Cole, & Lin, 2000). Finally, managers of closely-held companies encounter greater internal monitoring than managers of widely traded firms (Gilles, 1999). This discussion suggests that closely-held companies have different characteristics from their widely traded counterparts which might influence their strategic orientation and their choice of organizational design, types of control, and types of management accounting systems.

Following a recent development in organizational and management sciences that investigates the role of contingency fit for an evolving system and its environment on the survival of organizations, this study adopts a fitness landscape-theory approach to define contingent-fit between strategic orientation and firm structure. Building on fitness landscape theory (Kauffman, 1993), we define contingent-fit as the weighted sum of the independent contribution of each contextual variable to the chosen strategy (see also Jermias & Gani, 2002; Levinthal, 1997). Fitness landscape theory is derived from the biological view that organisms evolve over time to survive and that this evolution can be viewed as a journey to find a better fit to increase the chance of survival. This theory has been used to investigate organizational development and strategy (Maguire, 1997) and how to manage technological change and innovation (Aldrich, 1999; McCarthy, 2002).

Data were collected from business-unit managers of both widely-held and closely-held Indonesian companies which manufacture and sell food and beverages, tobacco, pharmaceuticals, cosmetics, households, textile, and foot ware. As predicted, contingent-fit has a positive relationship with business-unit performance. The higher the fit level, the better the performance. The results of the study also indicate that widely-held companies perform better than their closely-held counterparts. However, this advantage decreases with increasing level of contingent-fit.

This study contributes to the literature in two ways. First, it extends prior research on the contingency relationship between contingent-fit and effectiveness in widely-held companies to include closely-held companies that presumably have different environments. Second, it adds to the limited body of knowledge in integrating business-unit strategy, organizational design, types of control, and types of management accounting systems with business-unit performance. This study introduces a method to develop and measure the fit between strategic orientation and the firm's structure using fitness landscape theory. This theory has been considered as one of the most appropriate approach to investigate the relationship between evolving systems and performance (e.g., Dooley & Van de Ven, 1999; Jermias & Gani, 2002; Levinthal, 1997).

The remainder of the paper is organized as follows. The next section presents the underlying theory used to develop and measure the contingent-fit construct, followed by the related literature review. The research model and hypotheses are presented in section four. The fifth and sixth sections present the research method, data analysis, and results. The paper concludes with a discussion of the major findings, limitations, and directions for future research.

2. Theoretical background

Management and organizational science literature reflect a growing interest in investigating the ability of organizations to survive. Some recent studies have proposed that contingent-fit between strategic orientation and its contextual variables tends to have a positive association with performance (Beinhocker, 1999; Levinthal, 1997).

The concept of fit has long been used in management accounting literature to investigate the contingent relationship between management accounting systems, its contextual variables, and organizational performance (Ferris, 1988; Otley, 1980). A

number of major attempts have been made recently to construct the fit between strategic orientation and its contextual variables. Each attempt is motivated by a conviction that the latter is inadequate to explain the former.

We adopt a fitness landscape approach to develop and measure the contingent-fit between strategic choice and its contextual variables and use regression analysis to evaluate the moderating effects of contingent-fit on the relationship between ownership structure and performance. Fitness landscape approach is considered by many as an appropriate approach to investigate the ability of organizations to survive (see for example Beinhocker, 1999; Dooley & Van de Ven, 1999; Jermias & Gani, 2002).

Jermias and Gani (2002) propose that there are five steps to test the relationship between contingent-fit and performance. First, an ideal model should be developed based on the hypothesized relationship between strategic priorities, degree of centralization, types of control, and types of management accounting systems. Second, the range of possible scores for each contextual variable should be determined. Third, the ideal (perfect) contingent-fit score can be generated based on the proper match between business strategy and its contextual variables using the following formula¹:

$$\text{Fit}_j = \frac{1}{N} \sum_{i=1}^N X_{ij}, \forall_j = 1 \dots J.$$

Where, Fit_j : the total contingent-fit value of entity j ; X_{ij} : fit contribution of contextual variable i for entity j ; N : the number of contextual variable in the model; J : the number of entities.

Fourth, the scores of the contextual variables obtained from sampled business-units can be compared with their respective ideal to determine the contingent-fit-index for each business-unit. Finally, the relationship between contingent-fit and performance can be examined.

The contingent-fit value represents the ability of the business-unit to survive (represented by business-unit performance). It is expected that the contingent-fit value will have a positive association with business-unit performance.

3. Related previous literature and hypothesis

The research model used in this study is based on the following set of arguments: first, the strategy chosen by an organization determines to a large extent the uncertainty with which the organization must cope (Chandler, 1962; Gupta & Govindarajan, 1984; Miles & Snow, 1978). Second, different organizational designs and management accounting systems are available to help organizations cope with uncertainty (Galbraith, 1973; Lorsch & Allen, 1973; Lorsch & Morse, 1974; Tushman & Nadler, 1978). The key organizational designs that firms can use to cope with uncertainty are design of organizational structure

¹ This model assumes that deviations from ideal patterns for any contextual variables have an equal effect on business-unit performance. For example, the performance effect of a one unit deviation from the ideal pattern of degree of centralization is equal to a one unit deviation from the ideal pattern of types of control.

(Chandler, 1962; Galbraith, 1973; Tushman & Nadler, 1978) and design of control systems (Hayes, 1977; Hirst, 1983; Lorsch & Allen, 1973). Certain management accounting systems might also enhance the companies' ability to deal more effectively with uncertainties of their customers, competitors, technology, suppliers, and economic circumstances. Galbraith (1993), for example, reports that companies particularly those pursuing a strategy of differentiation try to reduce uncertainties by developing integrated reporting systems that link customers' requirements to product design and production scheduling to ensure timely and reliable delivery. Similar linkage with suppliers can also help companies achieving quality and delivery targets (Kaplan & Norton, 1996). Some companies use benchmarking to reduce uncertainties related to their competitors. Benchmarking often help companies improve their performance by reducing uncertainties surrounding their competitive advantage through learning the best practices used by international firms and establishing valid expectations based on other companies' experience (McNair & Leibfried, 1992). And third, matching organizational design and management accounting systems with strategy is likely to be associated with superior performance (Chenhall & Langfield-Smith, 1988; Moores & Yuen, 2001; Fig. 1).

This study used Porter's (1980) strategy framework, since this approach is academically well accepted and internally consistent (Dess & Davis, 1984; Hambrick, 1983). Porter identifies two generic ways in which a business-unit can gain a sustainable competitive advantage: low-cost and product differentiation. A low-cost strategy emphasizes the need to incur the lowest cost in an industry. This strategy requires aggressive construction of efficient scale facilities, vigorous pursuit of cost reductions from experience, tight cost control, avoidance of marginal customer accounts, and cost minimization in areas such as research and development, service, sales force, and advertising.

A product-differentiation strategy, by contrast, focuses on satisfying the customers' needs in terms of product features, product quality, and customer services. Product differentiation business-units tend to select one or more attributes that their customers perceive as important and uniquely position themselves to meet those needs. Porter (1985) argues that product differentiation business-units are rewarded for their uniqueness with premium prices. It should be noted, however, that a business-unit pursuing a low-cost

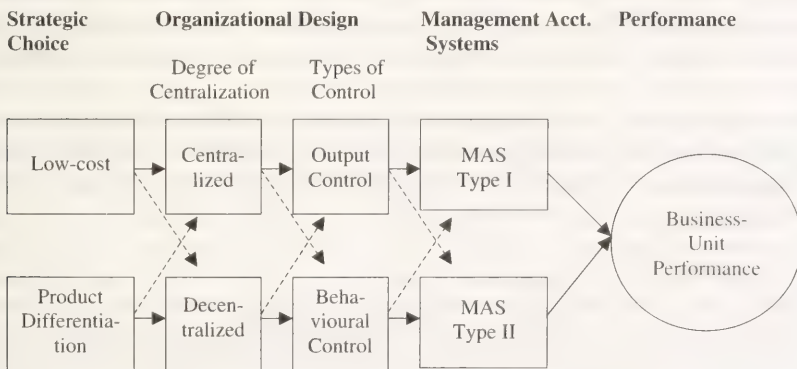


Fig. 1. The model (adopted from Jermias and Gani, 2002) for testing the impact of contingent-fit between strategic choice, organizational design, and management accounting systems on business-unit performance.

strategy does not imply that it can ignore quality, service, features, or other bases for differentiation. Similarly, a business-unit pursuing a differentiation strategy cannot ignore costs. As Porter (1985) correctly asserted, a strategy of differentiation does not allow a business-unit to ignore costs and a strategy of low-cost cannot ignore quality and services, but rather they are not the primary strategic target.

Researchers such as Chenhall and Langfield-Smith (1988) and Shank and Govindarajan (1993) argue that to affect performance positively, competitive strategy should be supported by an appropriate control system, organizational structure, and management-accounting systems. Previous studies have reported that a proper match between competitive strategy and its contextual variables enhanced a company's performance (Chenhall & Langfield-Smith, 1988; Miller, 1981; Moores & Yuen, 2001).

3.1. Linking competitive strategy and degree of centralization

Organizations need to adapt quickly to their market environment to achieve and maintain competitive advantages (Day, 1991; DeGeuss, 1988; Senge, 1990). Govindarajan (1986) and Gupta (1987) argue that the choice of a product differentiation rather than a low-cost strategy would increase uncertainty in a business-units' task environment for the following reasons. First, product innovation is likely to be more critical for business-units employing a differentiation strategy than for those employing a low-cost strategy. With strong emphasis on new product developments, product differentiation business-units will face high uncertainty since they are betting on products that have not yet crystallized.

Second, business-units employing a product-differentiation strategy tend to have a broad set of products in order to create uniqueness. Previous researchers (e.g., Chandler, 1962; Gupta, 1987) have argued that product breadth is associated with high environmental complexity and, consequently, with uncertainty. In contrast, business-units employing a low-cost strategy tend to have narrow product lines to minimize inventory carrying costs and to benefit from scale economies.²

Finally, creating and sustaining differentiation require incurring discretionary expenditures in several areas such as improvement of quality and speed of delivery, advertising to build product image, and research and development. In contrast, a low-cost strategy implies economies in all forms of discretionary expenditures. Accordingly, implementing a differentiation strategy is likely to require decision making by intuitive judgment to a greater extent than will implementing a low-cost strategy.

Because creativity and innovativeness are crucial to differentiate themselves in the market characterized by dynamic environments, business-units that adopt a product-differentiation strategy will benefit more from decentralization than those that adopt a low-cost strategy.

² Although a business-unit is pursuing a low-cost strategy, it cannot ignore quality, service, features or other bases for differentiation. Similarly, a business-unit pursuing a strategy of differentiation does not allow the unit to ignore cost. As Porter (1980) asserts, "... a strategy of low-cost implies that low-cost relative to competitors becomes the running theme through their entire strategy, though quality, service and other areas cannot be ignored. (p. 35) and ... a strategy of differentiation does not allow the firm to ignore costs, but rather they are not the primary strategic target. (p. 37).

3.2. Linking competitive strategy and control system

Porter (1980) states that low-cost business-units can be characterized by their vigorous pursuit of cost reduction, employing people with high levels of experience, practicing all possible economies of scale, acquiring process-engineering skills or the skills needed to design an efficient plant, employing a routine task environment, and producing standard, undifferentiated products. These characteristics imply that the knowledge of ends and means is relatively high. Since costs are typically easily determined and outputs are more observable, low-cost business-units tend to use output control for maximum effectiveness.

Product differentiation business-units tend to have difficulty implementing comprehensive control systems due to changing demands of their environment (Miles & Snow, 1978). Business-units pursuing a differentiation strategy tend to rely on strong basic research to produce unique products in which the knowledge of means and ends is low and outcome observability is also low. Govindarajan and Fisher (1990) argue that since control should be based on degree of observability, it is desirable for product differentiation business-units to use socialization, or behaviour control. In a similar vein, Ouchi (1979) argues that since the output of basic research tends to be long term in nature, short term output measurement on monthly, quarterly, or annual intervals is usually not available. Therefore, output control is considered inappropriate for this type of strategy.

3.3. Linking competitive strategy and management accounting systems

Information provided by management accounting systems (MAS) helps organizations adopt and implement plans in response to their competitive environments. Traditional approaches to management accounting do not provide the type of information that managers require to develop and support an organization's strategic choices (Johnson & Kaplan, 1987; Shank & Govindarajan, 1993). Recent management-accounting practices have emerged that focus on developing more accurate product costs, provide more information for evaluating organizational effectiveness, and relate activities and processes to strategic outcomes. Many of these management-accounting practices have the potential to provide benefits to organizations that emphasize either product differentiation or low-cost strategies. However, different managerial mindsets underlying product differentiation and low-cost strategies may influence preferences for particular management accounting practices (Shank, 1989).

Companies that emphasize product-differentiation strategy focus their efforts on satisfying customer needs for high-quality products, specialized design features, fast and reliable delivery, and effective post-sales support (Porter, 1985). To ensure that customer-focused activities are emphasized, companies need to develop closer linkages among all stages of their operational processes, their suppliers, and their customers (Hayes, Wheelwright, & Clark, 1988). Traditional management-accounting approaches are unlikely to be sufficient for assessing customer-focused activities. Therefore, we propose that product differentiation business-units will benefit more by using management accounting systems that provide measures of customer satisfaction, timely and reliable delivery, and measures of key production activities, quality, benchmarking, employee-based measures, and strategic planning (MAS type II).

High-performing companies emphasizing low-cost strategies, by contrast, will focus primarily on ensuring that production processes are highly cost efficient (Porter, 1985). To achieve cost efficiencies, companies may focus on improving existing processes. This may entail down-sizing operations to reduce costs quickly (Hamel & Prahalad, 1994) and reducing non-value-added activities (Hayes et al., 1988). In some companies, further improvements in cost effectiveness require implementing innovation in manufacturing systems such as new manufacturing processes or investing in a new plant (Hamel & Prahalad, 1994) or outsourcing manufacturing operations when external companies can supply at a lower cost while maintaining required quality and delivery standards. The type of formal performance measures appropriate for companies emphasizing a low-cost strategy will focus mainly on controlling costs. Thus, traditional management-accounting systems such as budgetary performance measures, variance analyses, and activity-based costing (MAS type I) are suitable for these companies (Chenhall & Langfield-Smith, 1988).

3.4. Hypothesis

This study employs a contingency approach to investigate the influence of a proper match between strategic choice and its contextual variables on the relationship between ownership structure and business-unit performance. The contingency approach is based on the assumption that there is no one universal system of accounting that is optimal for every environment and context in which these systems operate. Rather, this theory asserts that there is a contingent relationship between competitive strategy, organizational design, and types of management accounting systems. Achieving a proper match between strategic choice, organizational design, and management accounting systems enhance organizational performance. Therefore, we predict that there will be a positive relationship between contingent-fit and business-unit performance.

Previous discussions also suggest that closely-held companies tend to have limited access to financial resources and professional executives, and use more family oriented management style as compared to their widely-held counterparts. Therefore, we expect that widely-held business-units will perform better than closely-held business-units. The performance differential, however, will decrease with increasing fit level. Although we expect a positive correlation between contingent-fit and performance for both widely-held and closely-held business-units, the benefits of improved fit will be higher for poor performing firms (i.e., closely-held business-units) than for high performing firms (i.e., widely-held business-units). Due to their superior access to financial and human resources, managers of widely-held business-units are quite well equipped to develop their marketing acumen, embrace changes in technology and explore every available opportunity to optimize their performance. In contrast, many managers in closely-held business-units are family members who lack of these crucial skills and they tend to develop a level of comfortable inefficiency (Foster, 1992) and would continue to behave like a monopoly and management creativity would not grow strong (Grosse & Yanes, 1998). This implies that there is relatively more opportunity for improvement for closely-held business-units as compared to widely-held business-units. Therefore, the impact of aligning business strategy with its contextual variables is expected to be greater for closely-held business-

units as compared to their widely-held counterparts. Specifically, we examine the following hypotheses:

H1. Contingent-fit between competitive strategy and its contextual variables is positively related to business-unit performance.

H2. Widely-held business-units perform better than their closely-held counterparts.

H3. The magnitude of the performance differential between widely-held business-units and closely-held business-units decreases with an increasing level of contingent-fit.

We use the following regression model to test the hypotheses:

$$\text{PERFORM}_i = \gamma_0 + \gamma_1 \text{FIT}_i + \gamma_2 \text{OWNER}_i + \gamma_3 \text{FIT}_i * \text{OWNER}_i + \epsilon_i \quad (1)$$

Where, PERFORM_i : performance of business-unit i is determined by return on investment, profit, cash flow from operations, cost control, development of new products, sales volume, market share, market development, and personnel development and their relative importance to the company; FIT_i : contingent-fit between competitive strategy and its contextual variables for business-unit i ; OWNER_i : an indicator equal one for widely-held company and zero for closely-held company.

Eq. (1) allows us to estimate the effects of, FIT, OWNER and $\text{FIT} * \text{OWNER}$ on business-unit performance. The coefficient on FIT represents the linear relationship between FIT and performance. The estimated coefficient for OWNER represents the average difference in performance between widely-held business-units and closely-held business-units, while the coefficient on $\text{FIT} * \text{OWNER}$ represents the effect of an increasing fit level on the overall relationship between OWNER and performance. We expect positive coefficients on FIT and OWNER but a negative coefficient on $\text{FIT} * \text{OWNER}$.

4. Research method

A questionnaire survey and personal interviews were conducted to collect data from business-unit managers³ in the target companies. After high level approval was obtained indicating the companies' willingness to participate in this study, we requested that the top management nominate business-units and contact persons to whom the questionnaires should be sent.

4.1. Variable measurement

The questionnaire⁴ used in this study was developed and refined based on prior studies (See Table 1 for the questionnaire). Each questionnaire consists of six sections. The first

³ For the purpose of this study, a business-unit is defined as either an organization, or a segment of an organization that function as a profit centre.

⁴ The questionnaire was reviewed by three colleagues and a strategic management executive for clarity and understandability prior to administration. A pilot study involving four business unit managers was also conducted to obtain preliminary results related to the hypotheses developed in this study and to investigate any changes necessary before the final survey and interview. See Table 2 for the survey questionnaires.

Table 1

Survey questionnaire (each statement was evaluated based on the scale of 1 to 7, where 1=significantly lower and 7=significantly higher)

A. Competitive strategy (please position your products relative to leading competitors on 7-point Likert scale in the following areas):

1. Product selling price
2. Percent of sales spent on research and development
3. Percent of sales spent on marketing expenses
4. Product quality
5. Product features
6. Brand image
7. Introduction of new product
8. Make changes in design
9. Fast and reliable delivery
10. Post-sales support

B. Degree of centralization (please indicate the typical influence you had in affecting the outcome of each operating decisions that could effect SBU performance, where each number is represented by the following statements):

1. Increasing (beyond budget) the level of expenditure for advertising and promotion
2. Changing the selling price on a major product or product line
3. Increasing (beyond budget) the level of expenditure on research and development
4. Increasing (beyond budget) the number of employees in a business-unit.

C. Type of control (please indicate whether the following statements reflect your superior actual approach to managing his business-units):

1. The attainment of the sales targets set for your business-unit
2. The attainment of the expenses targets set for your business-unit
3. The attainment of market share targets set for your business-unit
4. The decision of the way of achieving these targets
5. The monitoring of decisions taken to achieve these targets on an ongoing basis
6. The monitoring of actions taken to achieve these targets on an ongoing basis

D. Management accounting system (MAS; please indicate whether you apply these measures):

1. Budgetary performance measures
2. Variance analysis
3. Manufacturing system innovations (improving existing process)
4. Activity-based costing
5. Outsourcing
6. Cost advantages of specific linkages with suppliers
7. Cost-volume-profit analysis
8. Measures of customer satisfaction
9. Timely and reliable delivery
10. Measures of key production activities (cycle time and throughput time)
11. Measures of quality
12. Benchmarking
13. Employee-based measures
14. Strategic planning

Table 1 (continued)

E. SBU performance (please indicate your SBU's performance relative to corporate standard and the degree of importance superior attached to SBU performance):

1. Return on investment
 2. Profit
 3. Cash flow from operations
 4. Cost control
 5. Development of new products
 6. Sales volume
 7. Market share
 8. Market development
 9. Personnel development
-

section requests demographic information about the respondent. The second to the sixth questions ask respondents to provide information about their business-units in terms of strategic priorities, degree of decentralization, types of control, management-accounting systems, and performance.

We adapted the questionnaires used in prior studies (Chenhall & Langfield-Smith, 1988; Govindarajan & Fisher, 1990; Innes & Mitchell, 1995; Jermias & Armitage, 2000) to measure strategic priorities, type of control, and type of management accounting systems. Strategic priorities were measured by asking respondents to indicate their product relative to their leading competitors on a seven-point Likert scale (1=significantly lower; and 7=significantly higher). Ten questions measure the tendency of respondents' business-unit toward certain strategic priorities. These include the product's selling price, percent of sales spent on research and development, product quality, product features, brand image, introduction of a new product, frequency of change in product design, delivery system, and post-sales support. A higher score is associated with a product-differentiation strategy while lower score is associated with a low-cost strategy. All questions are on the seven-point Likert-type scale. The strategy classification was derived as follows. If the total score is higher than the mean, the business-unit is classified as adopting a product-differentiation strategy. On the other hand, if the total score is below the mean, the business-unit is classified as adopting a low-cost strategy. If the total score equals the mean (i.e., the average total score=4), the business-units do not have a clear strategic priority and therefore were excluded from further analysis. We also use an alternative approach for strategy classification suggested by Cohen and Cohen (1983). A one-half standard deviation above (below) the mean of the competitive strategy scores was taken to represent product-differentiation (low-cost) strategy. This alternative approach was applied only to business-units with a clear strategic orientation [i.e., scores that are above (below) one-half standard deviation from the middle point].

The degree of decentralization was measured by responses to four questions about the level of autonomy given to business-unit managers. We asked respondents on a seven-point Likert-type scale (1=no influence; and 7=total autonomy) to indicate the typical influence on their operating decisions. Higher scores indicate more autonomous business-units.

Types of control were assessed by asking respondents to indicate the intensity-level used by their superiors to manage their business-units. There are six questions to measure this construct. The first three questions are designed to measure output controls and the last three questions are intended to measure behavioural controls. The intensity level is indicated by the degree of supervision exercised by their superiors (1=does not concern; 7=focus very significantly). Higher scores indicate a more intensive control system.

Types of management accounting systems used by the business-units are measured by asking respondents whether they use a particular management accounting system and the level of intensity of the usage of the system. There are 14 items to measure this construct. The first seven items are intended to measure management accounting systems that support low-cost strategy and the last seven questions are intended to measure management accounting systems that support product-differentiation strategy. Responses to these items indicate the intensity level of usage of a particular management accounting system (1=negligible; 7=very intensive).

To measure business-unit performance, we adapt questionnaires used by Govindarajan and Fisher (1990). Respondents were asked to position their product with respect to their companies' standard and also relative to their leading competitors' in terms of return on investment, profit, cash flow from operations, cost control, development of new products, sales volume, market share, market development, and personnel development. Respondents were also asked to indicate the relative importance of each item for their business-units. A single effectiveness score for each business-unit was obtained by a multiplication of nine performance dimensions with their respective relative importance for the business-units. Therefore, the highest possible score is seven and the lowest possible score is one.

The fit construct was developed and measured based on the fitness landscape theory outlined in the previous section. This construct represents the level of appropriate match between the chosen strategy and its contextual variables. For product-differentiation units, the appropriate match is defined as units that adopt a decentralized structure, use behavioural control, and use management accounting systems that support the units' ability to differentiate their product and to serve their customers. For low-cost units, the appropriate match is defined as units that adopt a centralized structure, use output control, and use management accounting systems that promote efficiency. To determine the level of contingent-fit, first we classify the sample into product differentiation and low-cost business-units as describe before. The contingent-fit score for each business-unit is determined by calculating the weighted sum of the responses to the questions about degree of centralization, type of control and type of management accounting systems. Since all respondents use both output and behaviour controls and both management accounting systems type I and type II, we use reverse coded for variables that are inconsistent with the chosen strategy. Therefore, to calculate the contingent-fit value for business-units that adopt a product-differentiation strategy, a reverse coded of output control and MAS type I was performed. For business-units that adopt a low-cost strategy, a reverse coded of degree of centralization, behaviour control, and MAS type II was conducted. These procedures are necessary to ensure that a higher score represents a better match between the chosen strategy and its contextual variables.

The contingent-fit value for each business-unit can be calculated as follows:

$$\text{Fit}_j = \frac{1}{3} \sum_{i=1}^3 X_{ij}, \forall j = 1 \dots 253.$$

where, Fit_j : total contingent-fit value for entity j ; X_{ij} : contingent-fit contribution from contextual variable i for entity j (i.e., $i=3$: degree of centralization, types of control, and types of management accounting systems).

The highest possible score (the ideal pattern) is seven and the lowest possible score is one.

5. Data analysis and results

We begin our analysis by assessing the construct validity of the variables used to test the hypotheses. The assessment is based on raw scores except for the contingent-fit construct in which some reverse coded were performed. All constructs are considered usable with Cronbach alpha coefficients greater than 0.75 (Nunnally, 1967).

A total of 281 business-units from 123 firms were received (115 business-units from 26 widely-held firms and 166 business-units from 97 closely-held firms). Twenty respondents (7 and 13 business-units from widely-held and closely-held companies respectively) were removed from the original sample based on Box Plot analysis which categorizes those twenty responses as extreme data resulting in 261 respondents. Eight respondents were also excluded from further analysis since they do not have a clear strategic orientation (their average total score equals to four). This results in 253 usable responses. When the strategic classification was based on one-half standard deviation above (below) the mean, the total usable responses were reduced to 185.

Table 2
Descriptive statistics of contextual variables by ownership structure

Variables	All sample ($n=253$)		Widely-held business-units ($n=106$)		Closely-held business-units ($n=147$)	
	Observed range	Mean (standard deviation)	Observed range	Mean (standard deviation)	Observed range	Mean (standard deviation)
Degree of centralization	1.00–7.00	3.87(1.31)	1.25–7.00	3.97(1.39)	1.00–7.00	3.80(1.26)
<i>Types of control:</i>						
Output	1.33–7.00	4.98(1.26)	2.00–6.67	5.35(1.13)	1.33–7.00	4.70(1.27)
Behavior	2.00–7.00	4.59(1.31)	2.33–7.00	4.67(1.44)	2.00–7.00	4.53(1.21)
<i>Types of MAS:</i>						
Type I	3.14–7.00	4.87(0.74)	3.14–6.71	4.94(0.73)	3.29–7.00	4.82(0.74)
Type II	3.29–7.00	5.46(0.93)	3.71–7.00	5.87(0.82)	3.29–7.00	5.16(0.88)

Table 3

Descriptive statistics of contingent-fit and performance by ownership structure

Unit of analysis	Significant difference ^a	Contingent-fit		Performance	
		Observed range	Mean (standard deviation)	Observed range	Mean (standard deviation)
<i>Panel A:</i>					
All sample (<i>n</i> =253)		2.78–5.54	4.05(0.45)	1.46–7.00	3.60(1.08)
<i>Panel B: partition by ownership structure</i>					
Widely-held (<i>n</i> =106)	WH>CH	2.78–5.29	4.02(0.41)	1.46–7.00	3.83(1.22)
Closely-held (<i>n</i> =147)		3.11–5.54	4.07(0.48)	1.62–5.95	3.43(0.94)

^a The significant difference between widely-held and closely-held sub-samples are based on the t -test of the performance mean ($p<0.01$).

We use Eq. (1) to investigate the relationship between contingent-fit and business-unit performance and the moderating effects of contingent-fit on the relationship between ownership structure and business-unit performance.

5.1. Descriptive statistics

Table 2 provides the descriptive statistics for the contextual variables and Table 3 provides the descriptive statistics for contingent-fit and business-unit performance for all companies partitioned by ownership structure. As predicted, widely-held business-units perform better than their closely-held counterparts. A univariate comparison in Table 3 indicates that the mean performance of 3.83 for widely-held business-units is significantly higher than the mean performance of 3.43 for closely-held business-units ($t=2.91$, $p<0.01$). Although there could be other explanations for differences in performance levels, this finding is consistent with previous literature which reports that widely-held business-units have a performance advantage over their closely-held counterparts due to a better access to financial and human resources (Gilles, 1999).

5.2. Hypothesis testing

Table 4 reports the regression results using both the average total score (column 3) and a one-half standard deviation above/below the mean (column 4) of the strategic priority scores as methods to classify business-units into their strategic priority.⁵ Since the results are consistent across both specifications (there are stronger results based on the one-half standard deviation above/below the mean, but at the expense of losing 68 observations), we use and discuss only the results based on the average total score to classify business-units into product differentiation or low-cost strategy.

⁵ By using the one-half standard deviation above/below the mean of strategy priority scores to classify business-units into product differentiation or low-cost strategies, sixty-eight business units were excluded from the analysis due to lack of clear strategy.

Table 4
Regression of business-unit performance on contingent-fit and ownership structure test of hypotheses H1, H2 and H3 (*p*-values in parenthesis)

Variables (1)	Prediction (2)	Results (3)	Results (4)
		Mean of strategic score coefficient (<i>p</i> -values)	One-half standard deviation above/below the mean coefficient (<i>p</i> -values)
Intercept	?	1.429 (0.344)	3.237 (0.227)
Owner	+	0.275 (0.02)**	0.302 (0.01)***
Fit	+	0.422 (0.05)**	0.448 (0.04)**
Fit*owner	–	–0.835 (0.08)*	–0.657 (0.01)***
Adjusted R^2		0.21	0.23
Sample size		253	185

* Denotes significance level of 0.10.

** Denotes significance level of 0.05.

*** Denotes significance level of 0.01.

The *F*-statistics for the regression are statistically significant ($p < 0.01$) and the overall explanatory power of the estimated regression is quite strong (adjusted $R^2 = 0.21$). The first hypothesis (H1) predicts that contingent-fit between competitive strategy and its contextual variables will be positively related to business-unit performance. The significant positive coefficient on FIT ($p = 0.05$) supports this hypothesis, thus indicating that business-units benefit from aligning their strategy with its contextual variables.

The second hypothesis (H2) predicts that widely-held business-units will perform better than their closely-held counterparts. The positive and significant coefficient on OWNER ($p = 0.02$) support this hypothesis. The result supports the view that due to their superior access to financial and human resources, widely-held business-units tend to perform better than their closely-held counterparts.

The third hypothesis (H3) predicts that the magnitude of the performance differential between widely-held business-units and closely-held business-units will decrease with an increasing level of contingent-fit. The negative and significant coefficient on FIT*OWNER confirms this hypothesis. The result indicates that the higher the fit level, the lower the performance differential between widely-held business-units and closely-held business-units. The result is consistent with the argument that there is relatively more opportunity for improvement for closely-held business-units as compared to widely-held business-units and, therefore, the impact of contingent-fit on performance is greater for closely-held business-units as compared to their widely-held counterparts.

It is interesting to note, however, that while we expect that the sum of the coefficients for FIT and FIT*OWNER to be positive, the results show the opposite (0.422 FIT–0.835 FIT*OWNER = –0.413). One possible explanation for this result is that for widely-held companies there are bound to be more inefficiencies which are being picked up in this estimation.

5.3. Robustness checks

In this section we discuss the results of additional robustness checks pertaining to the determination of fit construct and the development of the fit scores. We repeat our analysis

Table 5
Results of factor analysis by strategic choice

Factor	Eigenvalue	Percent of variance explained	
<i>Product differentiation:</i>			
Strategic choice	5.87		58.73
Degree of centralization	2.69		67.26
Type of control 1	2.63	43.85	
Type of control 2	2.03	33.81	77.65
Type of MAS 1	6.26	44.73	
Type of MAS 2	2.66	19.02	63.75
Performance 1	5.15	57.22	
Performance 2	1.07	11.85	69.07
Fit 1	1.65	33.00	
Fit 2	1.37	27.38	60.38
<i>Low-cost:</i>			
Strategic choice	5.87		58.73
Degree of centralization	3.17		79.35
Type of control 1	2.92	48.70	
Type of control 2	2.22	37.02	85.72
Type of MAS 1	8.26	58.99	
Type of MAS 2	1.48	10.55	
Type of MAS 3	1.25	8.91	78.45
Performance 1	5.88	65.38	
Performance 2	1.27	14.07	79.45
Fit 1	1.92	32.07	
Fit 2	1.29	21.56	
Fit 3	1.03	17.22	70.85

in Table 4 using factor analyses. To classify our sample into product differentiation and low-cost strategies, we create a dummy variable of strategic choice based on mean raw score of four for every item in the strategic choice questionnaires. Based on this procedure, we obtain a total of 258 business-units (108 widely-held and 150 closely-held business-units respectively).⁶ We perform two separate analyses for product differentiation and low-cost business-units and we analyze the research questions related to strategic choice, degree of centralization, types of control, types of management accounting systems, performance, and contingent-fit.⁷

As shown in Table 5, for product differentiation business-units, strategic choice has one factor (59% of the variance explained), degree of centralization has one factor (67% of the variance explained), type of control has two factors (77% of the variance explained), types of management accounting systems has two factors (64% of the variance explained),

⁶ There are three respondents that have factor scores equal to the cutting point and thus are excluded for further analyses.

⁷ This variable was generated based on the results from factor analysis of the contextual variables using principal components factor analysis with varimax rotation. In applying this procedure, factor with eigenvalues greater than 1.00 were retained.

performance has two factors (69% of the variance explained), and contingent-fit has two factors (60% of the variance explained). For low-cost business-units, strategic choice has one factor (59% of the variance explained), degree of centralization has one factor (79% of the variance explained), types of control has three factors (86% of the variance explained), types of management accounting systems has three factors (78% of the variance explained), performance has two factors (79% of the variance explained) and contingent-fit has three factors (71% of the variance explained).

We then correlate the fit factor with performance factor scores obtained from the previous analysis. The results are presented in Table 6. Overall, the results are generally consistent with those reported in Table 4 using raw data.

In addition, we also conducted a regression analysis using a fixed effects model to investigate the possibility that the observations may not be completely independent. As shown in Table 7, the results indicate that the relationship between fit and performance is positive and significant, $F=1.73$, $p<0.01$. The interaction effect, however, is not significant. Overall, the results of these two additional procedures are consistent with

Table 6
Correlation between contingent-fit and business-unit performance using factor analyses (p -values in parenthesis)

Unit of analysis	Prediction	Results
<i>A. Total sample (n=258)</i>		
Contingent-fit 1	+	0.12(0.03)**
Contingent-fit 2	+	0.31(0.01)***
<i>B. Partition by ownership structure</i>		
Widely-held Business-units (n=108)		
Contingent-fit 1	+	0.06(0.26)
Contingent-fit 2	+	0.37(0.01)***
Closely-held Business-units (n=150)		
Contingent-fit 1	+	0.21(0.01)***
Contingent-fit 2	+	0.26(0.01)***
<i>C. Partition by strategic choice and ownership structure</i>		
Widely-held-Low-cost (n=31)		
Contingent-fit 1	+	0.04(0.42)
Contingent-fit 2	+	0.01(0.49)
Contingent-fit 3	+	-0.14(0.23)
Widely-held-Product Differentiation (n=77)		
Contingent-fit 1	+	0.11(0.18)
Contingent-fit 2	+	0.66(0.01)***
Closely-held-Low-cost (n=66)		
Contingent-fit 1	+	0.27(0.01)***
Contingent-fit 2	+	0.08(0.26)
Contingent-fit 3	+	-0.28(0.01)***
Closely-held-Product Differentiation (n=84)		
Contingent-fit 1	+	0.19(0.04)**
Contingent-fit 2	+	0.33(0.01)***

** Denotes significance level of 0.05.

*** Denotes significance level of 0.01.

Table 7

Regression of business-unit performance on contingent-fit using a fixed effects model

Source	Numerator DF	Denominator DF	F-value	Significance
Intercept	1	82	2352.38	0.000***
Fit	103	82	1.73	0.005***
Fit*owner	17	82	0.90	0.576

*** Denotes significance level of 0.01.

those reported on Table 4 suggesting that contingent-fit contributes positively to performance.

6. Discussion, limitation, and direction for future research

This study reports a positive relationship between fit and business-unit performance. The results indicate that widely-held companies perform better than their closely-held counterparts. The magnitude of performance differential between widely-held business-units and closely-held business-units, however, decreases with an increasing level of contingent-fit. With limited access to financial resources and professional executives, and more family-oriented management style, closely-held companies might find it difficult to compete against widely-held companies. Improving the degree of contingent-fit between strategic orientation and its contextual variables might decrease the performance gap between widely-held business-units and their closely-held counterparts.

The results of this study should be interpreted in light of five limitations. First, the findings are based on data from Indonesian companies in industries that manufacture and sell products to end customers. Therefore, the findings might not necessarily reflect the general pattern of all companies across industries or across countries. Future research might use cross-industry data as well as data from other countries to investigate the impact of contingent-fit on business-unit effectiveness as well as organizational-level performance.

Second, while data collected from a survey and personal interviews might enable researchers to explore the richness of reality by obtaining information that is not widely available, possible bias due to subjective responses to the questionnaires should be taken into consideration. Future research might use publicly available data to measure companies' performance in areas such as return on investment, net income, or cash flow from operations, as well as to measure the contextual variables like research and development expenses and market share to enhance the reliability of the constructs.

Third, the model to measure contingent-fit assumes deviations from the ideal patterns of any contextual variables have equal effect on performance. This assumption can be relaxed by assigning different weight for the same unit of deviations of different contextual variables to represent the relative importance of the contextual variables on performance. However, since the relative importance of the contextual variables on performance is not known yet, this is left for future research.

Fourth, performance in widely-held companies might be affected by agency cost due to conflict of interest between management (agent) and shareholders (principal). Future studies might investigate whether managerial incentives affect performance differently for widely-held companies as compared to their closely-held counterparts.

Finally, other variables such as size, technology, and leadership style might also have a significant effect on business-unit performance. The use of a single industry sample coupled with the relative performance measures, however, minimizes the influence of these control variables on the results of this study.

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Discussion

Discussion of ownership structure, contingent fit, and business unit performance: A research model and empirical evidence

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1. Purpose of the study and definition of fit

The purpose of the study is to investigate the influence of contingent fit on the relationship between ownership structure and business unit performance. Therefore, the definition adopted for “contingent fit” is central to the development of theory, the collection of data, and the statistical analysis.

Van de Ven and Drazin (1985) indicated at least three different conceptual approaches to “contingent fit”—selection, interaction, and total systems approach. Each approach significantly influences the essential meaning of contingency theory and the expected empirical results.

The “selection” and “interaction” approaches are criticized for their inability to measure the fit of a total system, whereas the system’s approach is called into question because of lack of rigorous approach and of the relatively high level of subjectivity.

Jermias and Gani define “fit” as the proper match between the firm’s strategic orientation and its structure. They measure this construct based on the normalized sum of the “fit” contribution of each contextual variable as proposed by the fitness landscape theory. They adopted a fitness landscape theory approach to define “fitness” between strategic orientation and firm structure.

Fitness landscape theory is derived from biological sciences (Kauffman, 1993) in that organisms evolve over time for survival, and that such an evolution can be viewed as a journey to find a better “fit” to increase the chance of survival.

2. Hypotheses

1. The authors expect a positive relationship between “contingent fit” and business unit performance;
2. assume that widely held business units would perform better than closely held business units; and
3. predict that performance differential would decrease with increasing “fit” level.

They formulate these expectations in three hypothesis:

- H1.** Widely held business units will perform better than their closely held counterparts.
- H2.** “Contingent fit” between competitive strategy and its contextual variables will be positively related to business unit performance.
- H3.** The magnitude of the performance-advantage differential between widely held business units and closely held business units will decrease with increasing level of “contingent fit”.

3. The regression analysis

Jermias and Gani use regression analysis to evaluate influence of ownership structure on the relationship between “contingent fit” and business unit performance. The regression model takes the following form:

$$\text{PERFORM}_i = \gamma_0 + \gamma_1 \text{FIT}_i + \gamma_2 \text{OWNER}_i + \gamma_3 \text{FIT}_i * \text{OWNER}_i + \varepsilon_i$$

where:

- PERFORM_i : Performance of business unit i determined by return on investment, profit, cash flow from operations, cost control, development of new products, sales volume, market share, market development, and personnel development and their relative importance to the company,
- FIT_i : Contingent fit between competitive strategy and its contextual variables for business unit i ,
- OWNER_i : An indicator equal 1 for widely held company and 0 for closely held company.

4. Results

A univariate comparison of results indicates that mean performance of 3.83 for widely held business units is significantly higher than the mean performance of 3.43 for closely held business units; this finding is consistent with previous literature reporting that widely held business units has performance advantage over their closely held counterparts due to

a better access to financial and human resources; the F -statistics of the regression are statistically significant ($p < 0.01$; Adj. $R^2 = 0.21$);

The coefficient on “OWNER” is positively significant.

1. It means that widely held business units perform better than their closely held counterparts.
2. This result is consistent with hypothesis H1;

The results are also consistent with hypotheses H2 and H3.

5. Variable measurement

Based entirely on a questionnaire survey instrument developed and refined based on prior studies. The questionnaire was reviewed by three colleagues and a strategic management executive for clarity and understandability prior to administration. A pilot study was conducted to obtain preliminary results related to the hypotheses examined in the paper.

6. Comments

The participants' opinions in response to a questionnaire are often excessively subjective. The results may therefore be not as reliable as the regression results imply. The authors use several variables that are easily measurable, e.g. percent of sales spent on research and development, ROI, profit, cash flow from operations, sales volume, market share which increases the quality and reliability of data and of the study.

One of the potential explanations for the difference between mean performance of 3.83 for widely held business units and mean performance of 3.43 for closely held business units is likely to be the dissimilarity of the perceived meaning and measurement of business performance. Evaluating business performance of small businesses is often more challenging and complex than evaluating performance of larger firms.

Jermias and Gani specify five main characteristics distinguishing closely held companies from their widely held counterparts:

1. limited number of shareholders (often family members),
2. stocks are not actively traded on an established market or held widely enough to be subject to the disclosure requirements and oversight of securities regulators,
3. systems and procedures are heavily influenced by entrepreneurial owners,
4. owners often have a larger stake in the firm than owners of widely held companies,
5. managers encounter greater monitoring than managers of widely traded firms.

Viewed from a different perspective, however, there are three principal categories of differences between large firms and small companies that affect the business performance analysis:

1. *Operational differences*—meaning the way businesses are organized,
2. *Transactional differences*—meaning the way that such firms are traded in their respective transactional markets,
3. *Market dynamics differences*—in the data (in terms of both quantity and quality), methodology, and analytical factors that are involved directly in the business performance analysis.

From the business performance analysis perspective, the key operational differences between large companies and small companies are noted in Pratt, Reilly and Schweih (1998) as follows.

Item	Factor	Large firms	Small firms
1.	Separate accounting	Usually, there are relatively few transactions between the company and the individual equity owners; therefore, it is easy to keep the accounting affairs separate from the accounting for the equity owners' affairs.	Often, there are frequent transactions between company and the individual equity owners (e.g. shareholder receivables, shareholder payables, discretionary or personal expenses paid by the company on behalf of the owners, discretionary bonuses paid to the employee-owners, etc.); therefore it is sometimes difficult to keep a separate accounting between the company's affairs and the equity owners affairs.
2.	Owners' personal expenses	Normally, the owners' personal expenses are not paid by the business.	Often, the equity owners' discretionary expenses are paid by the business.
3.	Operational transactions with the equity owners	Generally, there are very few contractual or other transactions with the equity owners.	The equity owners often own the real estate and other assets used by the subject small firm; the equity owners lease these assets to the company.
4.	Separate commercial transactions	The company has business transactions that are totally separate from those of the equity owners.	The company business transactions are often not easily separable from those of the equity owners.

Managers of small firms are usually the owners of the business. Therefore, performance of such businesses should be measured by both return on labor (the owner's remuneration) and return on capital. Absent any need for third-party review, financial reporting is likely to emphasize minimizing taxable income. Accordingly, earnings may be understated. Thus, in small firms, return ratios that are based on earnings may be biased downward as compared to similar ratios for larger firms (assuming other factors unchanged).

There is also at least one key transactional difference between large companies and small companies: business buyer motivations. In large companies, the buyer's primary economic motivation is the expected return on equity-excluding personal salary considerations. In small firms the buyer is often "buying a job", so that the salary of the equity holder is considered part of the total return on investment analysis made by the business buyer (Pratt et al., 1998). This difference may affect the ratios used to measure business performance.

In other words, the same ratios may have completely different scope and meaning, depending on the size and type of the business. It is also generally true that smaller businesses are usually riskier than larger ones, which results in a higher cost of debt and a higher cost of equity when compared to larger companies in the same industry.

A practical demonstration of a higher cost of capital in small companies is the size premium, i.e. the excess return of the traditional CAPM (Stocks, Bonds, Bills, and Inflation. Valuation Edition 2003 Yearbook, Ibbotson Associates). Studies conducted by Ibbotson show that size premium increases as companies get smaller. Despite higher mortality rate in the population of small companies, many of them have substantially higher returns than larger ones. Therefore, one might expect that closely held companies (usually small businesses) would, on average, outperform widely held firms. This is contrary to the results of the study by Jermias and Gani—probably due, in part, to the authors' use of much broader definitions and measures of business performance.

Jermias and Gani distinguish between two competitive strategies that are derived from Porter (1985): (1) Low cost, and (2) Product differentiation. This classification raises a question as to whether it describes the differences in competitive strategies. What about branded products? Additionally, diversification itself has many dimensions, e.g. related diversified, unrelated diversified. The strategy classification was derived as follows. If the total score is higher than the mean, the business unit is classified as adopting a product differentiation strategy. On the other hand, if the total score is below the mean, the business unit is classified as adopting a low cost strategy. If the total score equals the mean (i.e. the average total score=4), the business units do not have a clear strategic priority and therefore were excluded from further analysis. Because of lack of clear strategy, the authors excluded only 8 out of 281 responses received.

This simplistic cut-off point is inadequate. To mitigate this problem, the authors applied an alternative approach for strategy classification based on one-half standard deviation above/below the mean of the competitive strategy scores. This partitioning would represent product differentiation (low cost) strategy as suggested by Cohen and Cohen (1983).

The latter approach includes only business units with clear strategic orientation (i.e. scores that are above/below one-half from the middle point).

7. Independence of variables

This study assumes that each contextual variable is independent of all the other variables. However, some researchers argue for exploring the relationships among the

contingency variables. Fisher (1998), for example, maintains that contingency research should move beyond simple correlation and attempt to determine causality.

8. Other questions

It would have been helpful if the authors have explored the following questions:

1. Are there any country-specific factors that might influence results of the study?
2. What will happen when we use cross-industry data rather than data from companies operating in end-users industries?
3. What will happen when we use other contextual variables? Which ones should be used and why? What weights should be attached to those variables? How should the weights be objectively established?

9. Conclusion

Despite the questions and issues raised above, this study is an interesting attempt towards investigating the influence of “contingent fit” on the relationship between ownership structure and business unit performance. Application of the model and its upgraded versions can be extended to other countries and industries.

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Reply

Response to discussion of “Ownership structure, contingent fit, and business-unit performance: A research model and empirical evidence”

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1. Introduction

Our paper investigates the moderating effects of contingent fit on the relationship between ownership structure and business-unit performance. We argue that closely-held companies tend to have limited access to financial resources, professional executives, and use more family-oriented management style as compared to their widely-held counterparts. Consequently, widely-held companies will outperform their closely-held counterpart but contingent fit will mitigate the performance advantage. Zarzecki (2005) raises several legitimate concerns about the paper. His comments and suggestions can be summarized into six issues. First, the conceptual ground for the performance advantage of widely-held companies over closely-held companies. Second, the reliability of the results given that the study relies solely on responses to questionnaires sent to respondents. Third, the use of performance index which consists of more than one variable to represent business-unit performance. Fourth, the method used to classify our sample firms into product differentiation and cost leadership strategy. Fifth, the assumption that each contextual variable contributes independently toward the contingent fit construct. Finally, the results of our study that might be affected by factors other than those identified in our paper. The following are our responses to each issue raised by the discussant.

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2. Performance advantage of widely-held companies over closely-held companies

Zarzecki (2005) argues that despite higher mortality rates in the population of small companies, many of them have substantially higher returns than larger ones. He concludes that closely held companies (usually small businesses) would outperform widely held firms (usually larger businesses). This argument is consistent with Jensen (1993) who proposes that managerial share ownership helps align the interest of shareholders and managers resulting in superior performance (also known as the convergence of interest hypothesis). It follows that since owners of privately-held companies are usually those who manage the business, the conflict of interest between shareholders and managers in privately-held companies tends to be lower than those in widely-held companies. Consequently, privately-held companies will perform better than their widely-held counterpart.

Recent empirical studies, however, found that increasing level of managerial ownership has negative effects on firm performance (Kole, 1995; McConnell & Sevaes, 1990; Morek, Shleifer, & Vishny, 1988; Short & Keasey, 1999). Short and Keasey (1999), for example, argue that the increasing level of managerial ownership can transfer additional risk to managers (i.e., owner–manager) beyond their non-diversifiable human capital which might lead to risk-avoiding behavior on the part of management that is not in the best interest of shareholders. In a similar vein, Zahra (1996) argues that managers' unwillingness to engage in risky but strategically important projects might jeopardize a firm's sustainable competitive advantage. Therefore, excessive risk carried by managers in closely-held companies tends to have a negative affect on the performance of the companies.

The empirical findings are consistent with the arguments mentioned in the paper that widely-held companies tend to perform better than their closely-held counterpart due to factors such as superior access to financial and human resources, better equipped to develop their marketing acumen and embrace changes in technology, and more willing to engage in risky but profitable projects due to limited risk beyond their non-diversifiable human capital.

Zarzecki (2005) also suggests comparing the performance of widely-held and closely-held companies in terms of return ratios. Following this suggestion, we perform a univariate comparison between widely-held and closely-held companies in terms of return on investment¹ (the only return ratio that we have in our performance variables). Table 1 shows the results of this procedure.

Table 1 indicates that the mean ROI of 3.49 of widely-held companies is significantly higher than the mean ROI of 3.08 ($t=2.512$, $p=0.006$). This result is consistent with those using all nine performance indicators reported in the paper. That is, widely-held companies outperform their closely-held counterparts.

3. Reliability of results that are based solely on responses to questionnaires

We acknowledge the limitation of the study due to its exclusive reliance on self-report measures. As in any studies using questionnaires to gather data, possible bias due to

¹ The return on investment in our study is measured based on managers' assessment of the difference between actual and budgeted ROI multiplied by the relative important of ROI to the business unit.

Table 1
A univariate comparison between widely-held and closely-held companies in terms of return on investment

Companies	N	Mean (ROI)	Standard deviation	t-value	p-value
Widely-held	106	3.49	1.52	2.512	0.006*
Closely-held	147	3.08	1.12		

* Denotes significance level of 0.01.

subjective responses to questionnaires may occur. Despite this limitation, the method enables us to explore the richness of reality by obtaining information that is not publicly available. Furthermore, given that our study investigates the impact of contingent fit on business-unit performance, the information that we need is not publicly available. Public information regarding performance measures of companies is usually available only in aggregate forms and does not contain detail information about performance of each business unit in the companies. Govindarajan and Gupta (1985) argue that since many performance variables critical to the success of a product differentiation strategy such as new product development, personnel development, and market development, are not available publicly, the use of publicly available measures to evaluate performance of every business unit regardless of its strategic choice violates one of the fundamental axioms underlying contingency research that include strategy as a contextual variable. We also believe that the results of the reliability test and procedures performed prior to administering the questionnaires as discussed in the "research method" section in the paper give us sufficient confidence in the appropriateness of the method used in our study.

4. The use of performance index which consists of more than one variables to represent business-unit performance

Our study assesses business unit performance based on a multiplication of nine performance dimensions with their respective relative importance perceived by the business unit. Govindarajan and Gupta (1985) argue that the use of a multivariate approach with criterion weights is particularly appropriate in a context where, by definition, different strategic missions imply quite different sets of priorities. Therefore, we believe that the measure of business-unit performance in the form of a comparison between actual and budgeted performance, and multiply the result with the degree of importance perceived by the business unit is suitable for our study because managers' a-priori expectations of business-unit performance are likely to consider the anticipated impact of the strategy adopted by the business unit.

5. The method to classify our sample firms into product-differentiation and cost-leadership strategy

We use a mean-split approach to classify our sample firms into their strategic orientation. As suggested by the reviewers of this journal, we also performed two alternative approaches for this purpose. First, we use a one-half standard deviation above

(below) the mean of the competitive strategy scores to represent product-differentiation (low-cost) strategy. Second, we use factor analyses by creating a dummy variable of strategic choice to group the strategic variable into product-differentiation and low-cost strategy. Given the results of the two alternative approaches are consistent with those of the mean-split approach, we believe that the results reported in the paper are robust to different approaches used to classify firms into their strategic orientation.

6. The assumption that each contextual variable contributes independently toward the contingent fit construct

We agree with Zarzecki's (2005) concern that the assumption of independent contribution of each contextual variable toward the overall fit value is an idealization. In a system with N contextual variables, the fit contribution of one variable may often depend upon the other $N-1$ remaining variables. One method to deal with the dependency among variables is by multiplying their fit contributions. Kauffman (1993) argues, however, that, in general, we almost have no idea what might be the mutual influences of the contextual variables on the overall fit of the system, and if the mutual contributions are affected by a large number of variables, the interacting variables are mostly unknown. Since the inter-relationship among contextual variables and their effects on fit are not known yet, we leave this for future research.

7. The results of our study might be affected by factors other than those identified in the paper

We thank Professor Zarzecki for his many useful suggestions regarding factors that might be considered to extend our study such as using publicly available information to minimize subjectivity, using data from other industry and/or other countries, and using other key operational variables that distinguish closely-held from their widely-held counterparts. We will take advantage of these comments and suggestions in our future work and also hope that readers of the paper might utilize those advices when analyzing the paper. We do believe, however, that the method used and results reported in our paper can be applied to other settings.

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Book reviews

Gary Giroux, *Detecting Earnings Management*, Wiley, United States, 2004 (x+326 pp).

1. Introduction

This book tackles an interesting topic that has become quite timely in the wake of recent financial-reporting scandals in the United States. It is primarily intended for intermediate and advanced financial accounting students and for any practitioner with a basic understanding of financial accounting (e.g., equity analysts, investors, financial executives). Accounting scholars who are interested in the topic will also find this book useful. Despite its relatively “heavy” content, the book is quite easy to read, largely due to the author’s effective writing style, his occasional use of humor, and extensive use of real-life examples. In particular, examples are drawn from the Apple Corp’s annual report throughout the book, and, where appropriate, additional references from other firms are employed. Although the technical parts of this book are best suited for US users, many of the technical and most of the non-technical parts could be used by international users to draw parallels with other reporting environments. The book has 11 chapters that naturally fall into three parts: chapters 1–3 (part one) describing the financial reporting environment, chapters 4–8 (part two) addressing earnings management in the financial statements, and chapters 9–11 (part three) presenting various other topics that are related to earnings management. A detailed chapter-by-chapter discussion is provided below.

2. Part one

Part one of the book, comprising chapters 1–3, describes the financial reporting environment. Chapter 1 introduces the topic by defining earnings management as the use of operating and discretionary accounting methods to adjust earnings to a desired outcome. (Alternative definitions of earnings management from the professional literature are provided in Appendix 1.1.) Giroux presents several reasons why managerial opportunism leads to earnings management pressures, to maximize short-term results, to meet market and analyst expectations, to convey an impression the firm is financially healthy, and to maximize managerial compensation. Next, the chapter outlines and briefly discusses the institutional factors that are related to the earnings management environment: corporate governance, auditing, accounting regulation and standard setting, earnings restatements,

SEC enforcement actions, attorneys, investment bankers, and whistle blowers. Appendix 1.2 provides a brief overview of the academic literature on the topic.

Chapter 2 traces the history of financial-reporting scandals in the United States. Its main theme is that recent scandals are, in part, similar to scandals from prior periods, both in nature and relative import. This overview of financial scandals through time allows the interested reader to gain insight into their common characteristics, such as corporate greed, earnings management, and a tolerant institutional environment. The chapter provides numerous examples of financial scandals that took place in the United States, starting from the most recent, such as Enron, WorldCom, and AOL-Time Warner, and going back to the crash of 1929 and the Robber Barrons of the 19th century. Appendix 2.1 provides a useful overview of the major financial regulations implemented by government and the private sector over the past 200+ years, which has often come in response to financial scandals.

Chapter 3 initially discusses the financial disclosures firms are required to make, explaining in sufficient detail the basic format of the 10-K, and more briefly the 10-Q, and the proxy statement. The author states that in evaluating a corporation's financial-reporting quality, the first step is a qualitative assessment of the firm's financial-reporting characteristics: the clarity of its business strategy, the reasonableness of its corporate-governance structure, the report completeness and timeliness, transparency, the extent of accounting conservatism, and any evidence of earnings manipulation. Potential areas of concern are highlighted for each of these characteristics. The second step is a detailed quantitative earnings management detection (EMD) strategy.

3. Part two

Part two, comprising of chapters 4–8, delves into the technical side of earnings management, focusing on each of the three major financial statements. Chapter 4 describes an EMD strategy for the balance sheet. The author proposes a two-step process, starting with a restatement of all balance sheet accounts as a percentage of total assets (common size analysis), and a comparison to direct competitors and prior years. Working capital and leverage ratios provide useful heuristics in level 1 analysis. Essentially, in level 1 analysis the investigator is looking for red flags. In level 2 analysis, the author highlights in detail several potential problem areas, in separate tables, for current assets and liabilities, long-term assets, long-term liabilities, and stockholders' equity. Each table outlines each of the major accounts, associated major earnings management concerns, and an EMD strategy for that account.

Chapter 5 provides an EMD strategy for the revenue side of the income statement. The investigator should be sensitive to managerial incentives to avoid reporting earnings below zero, below analyst forecasts, or negative earnings; also, earnings that violate debt covenants, compromise compensation expense, or raise political costs. In assessing income-statement quality, as it pertains to both revenues and expenses, level 1 analysis could involve comparisons to competitors, trends through time, and common size analysis. As with all financial statements, important information could be hidden in the management discussion and analysis or in the footnotes. Moving to level 2 analysis, the author discusses a series of potential problems in revenue recognition, the specific concern in

each case, and the suggested EMD strategy. Some of the important topics addressed are sales-recognition policies, bill-and-hold sales practices, reporting leases as sales, recognizing revenues before service is performed, and back-pocket sales. Several practical examples are employed to help illuminate each of these topics. Last, evidence is provided that earnings restatements are followed, on balance, by share-price declines. Chapter 6 considers expenses and non-recurring items. As with revenues, the key is the timing of recognition and the application of the matching principle in general. Level 2 concerns relate to the cost of sales, the capitalization of R&D, software development, goodwill costs, the treatment of reserves, depreciation methods, tax provisions, and expenses that are hidden in a generic "other expenses" category. Also, the reasonableness of amounts related to extraordinary items, discontinued operations, and accounting changes should be considered. In addition to individual accounts, an assessment of earnings per share, market value, and credit risk is suggested.

Chapter 7 studies the cash-flow statement. Unlike the income statement that is the prime ground for earnings management, relatively little can be done to manage cash flows. Nevertheless, a red flag would be any severe difference between the trend in net income and the trend in cash flows. Additional specific concerns relate to the composition of cash flows from operations, investment, and financing activities; also, marketable securities, taxes paid, stock options, negative working capital, and near zero cash balances. This chapter also discusses alternative bottom-line (earnings) numbers and their relative advantages and weaknesses, as well as pro forma earnings and S&P's core earnings.

Chapter 8 studies trends, norms, and quarterly analysis, essentially revisiting the issues from chapters 4 to 7 using multi-period techniques. The main insight in studying trends is that most earnings management activity is reversed in time. Studying the financial statements through time helps uncover such activity, and can be performed using common size analysis, growth analysis (studying percentage changes in the figures), and base-year analysis (studying percentage changes using a base year to create an index). Shortcomings of this approach are presented. One can similarly study temporal patterns in quarterly statements. Although quarterly information is seasonal, less complete, and unaudited, it is more timely, and is often more likely to contain irregularities. The author proceeds to outline various issues to look for when comparing financial statements through time, highlighting potential balance sheet, income statement, and cash flow problem areas separately. Detailed examples from the computer industry are used to highlight the main points.

4. Part three

Part three of the book is an amalgam of various topics pertinent to earnings management. Chapter 9 reviews business combinations as they pertain to earnings management. The author provides a brief overview of the reasons for takeover activity and the accounting treatment of business combinations, including the latest SFAS (141 and 142). Potential signals include the frequency and magnitude of acquisitions, prices paid, and how new acquisitions fit into a firm's long-term strategy. Also, more specific areas of potential concern following the acquisition are the accounting treatment of R&D,

goodwill, and the allocation of asset values. Next, the author provides examples of acquisition failures, a brief assessment of the related market reaction, and regulatory issues related to acquisition activity. Further, the author describes the accounting implications of ownership for equity investments, the equity method, and joint ventures, and how these environments can give rise to various off-balance-sheet techniques that affect the financial statements. The chapter closes by discussing the special earnings management implications related to divestitures and segment reporting.

Chapter 10 discusses corporate governance, compensation, and other employee issues. Initially, the role of the CEO and the board of directors are discussed, highlighting the importance of a board that is independent of the CEO, delegating work to board committees, and performance-related pay for outside directors. Next, the author discusses the importance of well designed, performance-based pay packages for corporate executives, the role of independent and competent audit-committee members, the compromising role of transactions by related parties, such as investment bankers, on independence, problems arising from insider-trading practices, and any evidence of past abuse and ongoing problems. Last, the author reviews accounting for pension and other post-employment benefits (OPEB). Potential areas for earnings management include, for example, the actuarial assumptions made about the discount rate, the return on plan assets, and compensation increases, their trends and comparison to actual data, any reported plan underfunding, negative pension (OPEB) expense, and the extent of pension (OPEB) plan investment in company stock.

Chapter 11 covers risk management, derivatives, and special purpose entities. After a brief review of the types of risk and common derivatives, the author highlights related earnings management concerns including the effectiveness of risk management and hedging practices, fluctuations in derivative activity, speculation activity, and the gain and loss recognition resulting from opting between fair-value and cash-flow hedges. Largely motivated by the Enron scandal, in the second part of the chapter the author discusses special purpose entities (SPEs), "separate legal entities established by asset transfer to carry out some specific purpose" (p. 290). Cause for concern arises, for example, when there is no apparent reason, based on the firm's expressed business strategy, for using SPEs, the relative magnitude of off-balance-sheet SPEs, ambiguous related disclosures, and their impact on financial ratios.

5. Discussion and conclusion

This book is best seen as tackling financial reporting quality in general, more than earnings management in particular. In several places in the book the discussion extends beyond the confines of earnings management to describe, for example, the general reporting environment, and the management of other types of financial data. A major challenge when dealing with financial-reporting quality in general or earnings management in particular is that these are elusive concepts. In many cases, current disclosure requirements cannot ensure the definitive identification of areas where earnings quality is compromised, or of items that are being manipulated. An additional challenge is that earnings management is more likely where judgment is involved. The author makes very

good suggestions on how to circumvent these problems with his two-step approach: first, look for red flags through qualitative analysis, as he provides numerous suggestions for potential areas of concern for each of the financial statements or specific settings; second, once potential areas of concern are identified, delve into each potentially problematic account in depth, studying trends, comparisons, statement notes, and management discussion and analysis.

Although the academic literature has not been very successful in developing definitive earnings management detection techniques, much work of value has been done that would deserve some attention, I think, in any book on detecting earnings management. For example, a section on the discretionary-accruals models that are common place in the academic literature might have been useful. In a related vein, a discussion on the motives for earnings management around corporate events such as equity offerings, litigation, share repurchases, initial public offerings and the related empirical findings would enhance the reader's understanding of the earnings management environment. On the other hand, the material in this book is likely to stir some interesting research questions in its academic readers. Further, alternative data sources that could be used in academic research are illuminated in the book.

In closing, given the breadth of the topic, it would be difficult for one book to tackle all issues involved in sufficient depth. The author has made a commendable effort to tackle a wide range of issues that are pertinent to earnings management. Most importantly, the book's greatest contribution is in positing an approach for detecting earnings management that is both easy to understand and fairly realistic to put in use. I would highly recommend this book to anyone who is interested in understanding how to detect earnings management.

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David A. Guenther, Financial reporting and analysis, International Edition, New York, New York, McGraw-Hill, 2005 (xx+521 pp).

This *International Edition* of **Financial Reporting and Analysis** by David Guenther of the University of Colorado, has three goals in mind. "*First, the book is highly conceptual in nature, examining financial reporting practice through the lens of economics...The second goal of the book is to give students a good sense of how financial accounting information is used...The third goal is to be rigorous in terms of topical coverage, while at the same time avoiding much of the detail that seems to overwhelm students*" (page vii). The text is only partially successful at achieving these goals, as will be discussed in the following paragraphs of this review. But to begin, a brief list of the contents of the textbook is as follows: (1) The Economics of Accounting Information; (2) Accrual Accounting and the Income Statement; (3) The Balance Sheet: Market Value versus Historical Cost; (4) The Cash Flows Statement

and the Importance of Cash Flows; (5) Notes Receivable, Notes Payable, and the Time Value of Money; (6) Timely Reporting: Recognizing Future Bad News Early; (7) Product Costs: Inventories and Cost of Goods Sold; (8) Allocating the Cost of Property and Equipment; (9) Accounting for Income Taxes; (10) Investments in Intangible Assets; (11) Investments in Other Companies; (12) Investments in Leased Assets (13) Financial Instruments and Derivative Securities; (14) Pension and Other Postemployment Benefits; (15) Shareholders' Equity; (16) Earnings Management; (Appendix A) Who Makes Accounting Standards and Why Do They Do It?; (Appendix B) Recording Accounting Transactions.

What can be readily seen in this list of contents is that apart from several chapters, the material is similar in many respects to the material covered in most intermediate financial accounting textbooks. This raises the question of whether there is something unique or novel about this text. In answering this question it is perhaps useful to note that the author's goal of being different and conceptual is most fully realized only in Chapter 1, dealing with the *Economics of Accounting Information*, Chapter 6, dealing with *Timely Reporting*, and Chapter 16, dealing with *Earnings Management*. The other chapters are essentially reduced versions of what would ordinarily be found in an intermediate financial accounting text, along with some rearrangement of material, for example, moving the treatment of Cash Flows to Chapter 4. That being said, there is a rather effective treatment of some recent difficult topics, such as *Derivatives* in Chapter 13.

The Preface to the text states that each of the chapters will be organized in the following way: (1) each chapter includes a discussion of how the financial accounting information discussed in the chapter is used to make decisions; (2) each chapter explains the relationship between the accrual accounting concepts discussed in the chapter and cash flows; (3) each chapter notes the differences between U.S. GAAP rules and the financial reporting practices in other countries. In pursuit of this organizing principle, different chapters focus the discussion on different companies (for example, DaimlerChrysler in Chapter 1). As far as I can tell the only purpose served by focusing on a particular company is to conform to the organizing principle set out in the Preface (see above).

While the text hews scrupulously to the organizing principle, it is only with regard to the second aspect of the principle that the objective is achieved. For example, in Chapter 2, dealing with *Accrual Accounting and the Income Statement*, the focal company is Microsoft. Income statements and extracts from footnotes for the financial statements of Microsoft are used to illustrate certain accounting concepts like accrual accounting; periodicity; revenue recognition; the matching principle; income statement display; materiality; discontinued operations; extraordinary items; and changes in accounting principle. There is a reasonably clear explanation of the relationship between these accrual accounting concepts and cash flows, but the discussion of how accounting information is used to make decisions is virtually absent. In addition, the discussion of the differences between U.S. GAAP rules and financial reporting practices in other countries is somewhat superficial, concentrating primarily on an illustration of what Microsoft's income statement would look like if it was prepared according to British GAAP. This lesser emphasis on the use of accounting for making decisions and on the comparisons between U.S. GAAP and financial reporting in other countries is replicated in most of the other chapters.

The author states that Chapter 6, *Timely Reporting: Recognizing Future Bad News Early*, is a distinctive aspect of the text. In this regard, the topics covered in Chapter 6 include the concept of economic income; accounting for bad debts; lower of cost or market asset impairments; restructuring charges; contingent liabilities; warranties; and discontinued operations. The author asserts that such accounting practices are evidence of conservatism. While this assertion may be accepted as accurate in a general sense, the question arises whether the concept of conservatism is as important or significant a concept, either in U.S. GAAP or in the financial reporting practices of other countries, as Chapter 6 would imply. In recent years, both the SEC and the FASB have de-emphasized conservatism as a fundamental principle, replacing it instead with fair-value measurements, which are deemed to be more relevant for decision makers. There is, of course, a certain correspondence between accounting practices which are said to be conservative and fair-value measurements. For example, reducing tangible fixed assets to their impaired values is congruent with a fair-value measurement approach. Even though there is no comparable ability to remeasure upwards in U.S. GAAP, one could nevertheless argue that revaluation downward due to a perceived asset impairment is a form of fair-value measurement and not necessarily a hallmark of conservatism in accounting practice.

This text has many good aspects. The writing is clear and the graphics are good. The chapter-end questions and exercises are well conceived and the support materials appear to be abundant. The primary question in the mind of this reviewer is whether this text offers much that is new or different to instructors of accounting in countries outside North America. The forthcoming requirement that all member states of the European Union adopt standards promulgated by the International Accounting Standards Board as of January 2005 makes this question even more pertinent. The text does not discuss or integrate IASB standards, thus presenting a lacuna which would caution against adoption of this text by most European and Austral-Asian instructors, other than in a course focusing primarily on U.S. GAAP financing reporting. Given the increasingly rapid evolution and convergence of financial accounting standards setting, one wonders whether a focus on U.S. GAAP will in the future be considered appropriate even in textbooks intended primarily for the domestic American market.

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Colin Drury, *Management and cost accounting*, 6th edition, Thomson Learning, London, 2004 (xxxii+1280 pp.).

Colin Drury's *Management and Cost Accounting*, now in its sixth edition, is one of many in the overcrowded field of management accounting textbooks. The topics that comprise management accounting are more or less standard throughout the world, which makes the choice for a specific textbook one of didactic considerations (as it

should with textbooks) and a matter of personal taste—where one student is enlightened by a term like “peanut butter costing,” others will feel more at ease with “plant-wide rate.” Next to the quality of exposition, there are several other issues which determine the quality of a textbook, such as the structure (ordering of chapters), the number and quality of the exercises, and the availability of (web) support.

1. Outline of the book

The book has six parts which are divided into 26 chapters. As the author indicates in his preface, the book’s structure is based on the premise that there are three main applications of management accounting information: profit measurement and inventory valuation using full costs, decision making using relevant costs, and management control.

Part 1, the introduction, consists of two chapters—one on the nature of management accounting and one on basic cost categorizations (fixed vs. variable, direct vs. indirect). Part 2 discusses “Cost accumulation for inventory valuation and profit measurement” in five chapters. Chapter 3, titled “Cost assignment,” discusses traditional and activity-based costing systems. Both approaches are presented as variants on the same principle of “two-stage allocations”: in the first stage, costs are grouped into pools, or centers. In the second stage, the costs of the pools or centers are allocated to the cost objects. Thus, rather than pitching activity-based costing as something completely different, it is presented as an extension of the traditional methods that use main (production) departments and support (service) departments: “ABC systems tend to establish separate cost driver rates for support centers, and assign the cost of support activities directly to cost objects without any reallocation to production centers” (p. 72). Also, it is recognized that the “traditional vs. ABC” dichotomy is partly a question of terminology: “To emphasize the point that ABC systems use cause-and-effect second stage allocations the term cost driver tends to be used instead of allocation base” (p. 74). In our experience, teaching ABC as “simply” another variant of cost assignment helps students understand it better than presenting it as a completely novel costing method. Chapter 4, which focuses on accounting entries for a job-costing system, can be skipped in management accounting courses. Chapters 5, on process costing, and 6, on joint costing, show that it is problematic to distinguish between the use of management accounting information for full-costing purposes and for other purposes: process costing is difficult (and interesting) when deviations of normal operations occur (e.g. treatment of abnormal losses), and in discussing joint costing the notion of relevant costs is essential. Finally, Chapter 7 deals with absorption versus variable costing.

Part 3, ‘Information for decision-making’, starts with a separate chapter (8) on break even analysis (which is a lot of attention for such a simple concept). Chapter 9 discusses relevant cost decisions in five settings: special orders, bottleneck calculations, replacement decisions, make-or-buy decisions, and discontinuation decisions. This chapter thus provides for a concise discussion of the nature of relevant costing issues:

simply look for those costs that change. Chapter 10, on ABC, seems a bit out of place: there is an overlap with Chapter 3 that may be confusing for students and while activity-based costing is discussed in the Part 3, "Information for decision-making," its relation to decision making is limited to a discussion on activity hierarchies (unit-level, batch-level, product-sustaining, and facility-sustaining activities). The chapter further discusses more advanced issues related to ABC, such as resource consumption versus resource supply. Pricing policies and customer-profitability analysis are discussed in Chapter 11, which is—like the chapter on break-even analysis—a bit low in content. After Chapter 12, on decision making under uncertainty, Chapters 13 and 14 deal with capital-investment decisions. The techniques are adequately discussed, although students will not understand annuities after reading Chapter 14, since this requires more attention than simply referring to an annuity table. Later in this review we will discuss Part 3 a little more.

In Part 4, "Information for planning, control and performance measurement," the first three chapters (15 to 17) provide a largely qualitative discussion of management-control issues. Topics such as control types (action vs. personnel vs. results controls), responsibility centers, the motivational quality of budgets, and the budgeting process are discussed adequately at an introductory level. The discussion on "contingency theory and organizational and social aspects of management accounting" is perhaps too in-depth; it falls out of pace with the rest of the book. Chapters 18 and 19 discuss variance analysis. The notation in these chapters does not help one understand the similarities between materials and labor variances. Also, the level of detail in the analysis is sometimes too much. We have yet to encounter an example of the usefulness of calculating variable overhead expenditure variance, or of the volume- efficiency variance of fixed overheads. Chapter 19 has some good qualitative discussions on different types of variances, and on the pros and cons of standard costing. Chapter 20, on divisional performance measures, deals with return on investment and residual income. Finally, Chapter 21 is about transfer pricing. The exposition of transfer-pricing issues uses economic reasoning (i.e. declining sales with increasing price), which is not the most optimal approach in a management accounting course. In our experience, the essence of transfer-pricing problems is better explained using relevant-cost decisions such as special orders.

Having presented the three main applications of management accounting in Parts 2 to 4, attention is directed at "new" techniques in management accounting in Part 5, "Cost management and strategic management accounting." Chapter 22 briefly discusses a variety of cost-management techniques such as life-cycle costing and target costing. It is difficult to get across the possibilities and difficulties of target costing in two pages or less, and the chapter does not succeed in this. Chapter 23 mainly deals with the balanced scorecard, its advantages and limitations. It lacks a discussion of what makes measures suitable (are they specific, measurable, accurate, etc.) and why non-financial measures are popular in the first place.

Finally, Part 6, "The application of quantitative methods to management accounting," discusses techniques such as regression analysis, economic order quantity, and linear programming in three chapters.

2. Discussion

The back cover plugs the book as “Europe’s market leading management accounting textbook.” We have to take the book’s word for it, but if this is really the case, where would this come from? What makes it stand out relative to its competitors? In this field, there is no escaping *Cost accounting, a managerial emphasis* (2003) by Horngren, Datar, and Foster (hereafter HDF), so let us take this book as a typical textbook. The one thing that immediately stands out is the logical structure of Drury’s book. By taking the main applications of management-accounting information as the basis for structuring, a logical grouping of topics results. For example, the basics of cost allocation are discussed in one chapter (3), instead of the four chapters scattered throughout HDF. Overall, the individual chapters cover topics that are logically grouped together. Since each instructor has his or her own preference in presenting the topics throughout a course, reference can be made to complete chapters rather than having to take bits and pieces out of different chapters.

Compared with the previous (fifth) edition, the number and order of the chapters have not changed; in fact, textual differences are rather limited. This brings us to the second strong point of the book compared to HDF: it chooses to present all concepts by using simple settings, with simple numbers presented separately in boxes, and not in running examples throughout the main text. Thus, the book explains each concept directly rather than in a complicated setting with many realistic embellishments. This presentation allows instructors to refer to the book while still using their own favorite examples and settings in class.

The major changes in the sixth edition are to be found in new material to support the main text. First, a number of “real-world view” boxes are introduced, to illustrate the use of accounting techniques in practice. In general, these are somewhat detached from the text itself, and do not always provide interesting examples. Second, each chapter concludes with a two-page summary that follows the learning objectives of the chapter. The summaries are very good in their length and depth. Third, the book provides fully worked answers to some 20 large exercises per chapter. Also, some 15 review questions per chapter are asked about the concepts and definitions discussed in the chapter, indicating the pages where the answers can be found. This is an excellent way of helping students study the theory as well as the techniques of management and cost accounting. Finally, all case studies have been moved to the web site accompanying the book, which allows the author to provide a greater number of case studies. The web support of the sixth edition offers teaching notes to all cases, as well as an abundance of extra questions and answers. These are not very helpful, however, given the large number already available in the book. Somewhat more interesting are the interactive multiple-choice questions with direct feedback. Powerpoint slides were not available yet at the time of writing this review.

There are two detailed issues that we would like to discuss, related to Chapter 3 and to Part 3. As we discussed above, in Chapter 3 Drury presents activity-based costing as an extension and improvement compared to traditional costing systems, rather than as a separate category of costing systems. We would suggest that this idea could be taken further by Drury and that accurate costing systems could be presented as a *continuum*. Chapter 3 could then talk first about general guidelines for improving cost-accounting

systems (such as more direct cost tracing, more homogeneous cost pools, cause-and-effect cost-allocation bases, going from averages to metered costs, and maybe even reciprocal cost allocations). In fact, HDF discuss such guidelines in a brief section (on page 140, 141) that is, however, not used as a main theme in their text. After that, Chapter 3 could position activity-based costing as being the kind of costing systems that incorporate "many" of such guidelines. Drury seems to implicitly consider activity-based costing as a gradual development, and we suggest making this an explicit and central leitmotif for treating costing systems.

A second detailed point is the connection between the Chapters in Part 3 "Information for decision-making." This connection is explained very clearly at the beginning of Chapter 9, where it is emphasized that "a decision relevant approach adopts whichever planning time horizon the decision maker considers appropriate for a given situation" (page 314). The chapter on capital-investment decisions (13) is introduced as being about the time value of cash flows. For *any* decision (not just for capital-investment decisions), the analysis should be about "future cash flows, which will differ between the various alternatives being considered" (page 314). We would suggest taking this approach one step further in terms of consistently discussing all decisions as applications of the differential cash-flow concept, whereby timing differences are covered through discounting. We would suggest discussing the examples in Chapter 9 such that the cash flows at different points in time are described with an explicit time horizon. For example, on page 322 and further, the decision on the replacement of equipment could be described in terms of the cash flows (for each alternative) in years 1, 2, and 3, and the three alternatives could be compared based on the net present value or other criteria discussed in Chapter 13. The examples in Chapter 9 do not explicitly talk about the timing of cash flows and the project horizon, and such differences hide the basic similarities between all decisions (as emphasized in the introduction to Part 3). In the same way, we would like to see a more explicit connection between the chapter on activity based costing (10) and the differential cash flow concept.

Some weak points of the book remain. Next to the content issues discussed in the outline and above, a major issue is the quality of the exercises. Many of the exercises require a good deal of number crunching before the actual concepts can be applied. Also, complex descriptions in the exercise aim to introduce real life complexity, but often lead to ambiguous problems, again deterring students from trying to understand the real issues. At over 1300 pages, it is quite voluminous (the fifth edition was called "the telephone book" by our students, and that had 100 fewer pages).

Ultimately, Drury's book is about the techniques of management accounting. As such, it is limited in its attention to new concepts (you won't find "key performance indicator" or "non financial measures" in the index, although the concepts are discussed) or specific types of organizations. If the student understands a concept such as cost allocation, he/she can apply it anywhere, whether it is a manufacturing, service, internet, or government organization. Since the explanation of the concepts is done very well, in a logical structure, the book is very well suited for introductory management accounting courses at the both the undergraduate and the graduate level. We expect to keep using it for a considerable time.

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
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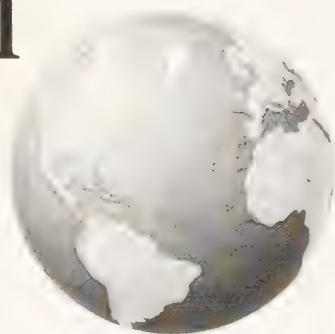
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The relevance of financial statement information for executive performance evaluation: Evidence from choice of bonus plan accounting performance measures

Debra L. Krolick*

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Abstract

I explore whether the type of accounting performance measure used in the CEO bonus plan provides an indication of the informativeness of the firm's financial statements for purposes of performance evaluation. Using contingency table analysis and LOGIT regressions, I find firms with high levels of unrecorded intangible assets rely significantly less often on accounting rate-of-return measures (vs. earnings alone) in executive bonus plans.

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Keywords: Intangible assets; Bonus plan; Accounting rate of return

1. Introduction

I explore whether the Compensation Committee's choice of accounting performance measures in the bonus plan for corporate officers provides an indication of the relevance of the firm's financial statements. I examine the relevance of accounting information for the evaluation and compensation of top corporate executives.

I investigate whether the Compensation Committee's choice of bonus plan accounting performance measure reflects the expected informativeness of the balance sheet for

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purposes of performance evaluation. I hypothesize that firms with significant investments in intangible assets not reflected on their balance sheets avoid accounting rate-of-return measures (in favor of measures based on only income statement information) in executive bonus plans. Using proprietary data from Hewitt Associates, I document that firms expected to have high levels of unrecorded intangible assets rely significantly less often on accounting rate-of-return measures in executive bonus plans.

While an extensive body of capital market research examines the information content of financial statement information for valuing corporate equity, relatively little prior empirical research explores a firm's choice among specific accounting measures for evaluating the performance of executives. I document systematic differences among the firms' choices of accounting performance measures in executive bonus plans and examine whether these choices vary with the intensity of the firms' investments in intangible assets.

The study proceeds as follows. Section 2 presents background information and develops the hypotheses, Section 3 reviews related literature, and Section 4 discusses the sample and data. Section 5 explains my proxy for investment in intangible assets, and Section 6 analyzes the relation between accounting performance measure choice and expected level of unrecorded investments in intangible assets. Section 7 concludes the study.

2. Background information and hypothesis development

The bonus plan is only one component of total executive compensation. Besides a salary and bonus, a CEO might receive stock options, stock appreciation rights, phantom shares, performance units, performance shares, or other types of incentive pay.¹ The Compensation Committee can choose different performance measures, including stock return, accounting return, and nonfinancial measures, to determine how much of each form of compensation the executive will earn. Results from theoretical literature support the use of multiple performance measures to induce the desired allocation of effort among the agent's multiple tasks and to reduce the noisiness of performance measures resulting from events beyond the manager's control.² While many types of compensation are based on stock return measures, virtually all bonus plan contracts rely on accounting measures: earnings-based, accounting rate-of-return, or both. I interpret the choice of bonus plan performance measure as providing information about the Compensation Committee's belief in the relative informativeness of financial statement summary measures.

I divide firms into two categories: those with only income statement information as bonus plan performance measures, and those with rate-of-return performance measures, or

¹ A *stock appreciation right* permits the executive to receive in cash the difference between the stock price and the exercise price. Executives earning *phantom shares* receive the cash value of the shares rather than the stock itself. A *performance unit* permits executives to earn an amount of cash that depends on the attainment of long-term performance goals based on accounting numbers (such as earnings per share or return on assets). *Performance shares* are similar to performance units except that the executive earns shares of stock instead of cash. The annual bonus is only one component of the executive's total compensation package which may include these long-term accounting-based plans.

² See, for example, Holmstrom and Milgrom (1991) and Feltham and Xie (1994).

a combination of income-statement-based and rate-of-return measures.³ I define income statement information to be a measure of earnings or some component of earnings, such as sales. Accounting rate-of-return measures combine income statement and balance sheet information by dividing income by a measure of assets (return on assets), equity (return on equity), or total capital (return on capital).

The examination of the choice of accounting performance measures in bonus plans presents an opportunity to discern the Compensation Committee's beliefs about the informativeness of performance measures based, in part, on the firm's balance sheet. I assume the Compensation Committee chooses the accounting performance measure(s) that best reflect executives' contribution to firm value. Holmstrom (1979) shows that any costless performance measure that is marginally informative about an agent's actions will improve the efficiency of the contract with the agent. Under Holmstrom's definition, a measure is informative if no second measure (or set of measures) is a sufficient statistic for the first measure with respect to the agent's actions. Given that firms are required to report the balance sheet and income statement to shareholders, it is reasonable to view performance measures based upon these financial statements as costlessly available for contracting purposes. Consequently, I interpret the selection of a rate-of-return performance measure, which incorporates both balance sheet and income statement information, to be an indication of the relevance of the balance sheet for purposes of performance evaluation.⁴

Results from the theoretical literature suggest reasons why a Compensation Committee might choose particular bonus plan performance measures. Banker and Datar (1989) show that the relative weight on each of two linearly aggregated performance measures depends only on the sensitivity of the measure to the agent's actions and the precision with which the measure captures the agent's actions. Feltham and Xie (1994) characterize the value of including an additional performance measure in a contract as a function of the precision of the measure and the congruence between the impact of the agent's actions on the measure and on firm value. Paul (1992) shows analytically that stock price need not provide efficient incentives in a multi-task setting because price captures the *value* of the firm rather than the *value-added* by the manager. Bushman and Indjejikian (1993) model how the relative weights on earnings and stock price in a compensation contract vary with the information content of earnings.

For firms with significant investments in internally generated intangible assets, rate-of-return measures will not capture completely the relation between net income and the investments that generate net income. While the income statement reflects revenues earned from total assets in place, both tangible and intangible, the balance sheet reflects the acquisition cost, less depreciation, of only tangible and acquired intangible assets, omitting investments in internally developed intangible assets. As a result, Compensation Committees of firms with significant investments in these assets may be more likely to rely only on income statement information to determine executive bonuses. This problem

³ Firms do not usually disclose the weights applied to bonus plan performance measures. Therefore, the arbitration based on reliance on or avoidance of accounting rate-of-return measures is used only as an indicator of the relative informativeness of financial statement information between the two groups.

⁴ None of my sample firms uses a bonus plan performance measure based on only balance-sheet information (e.g., capital expenditures or debt reduction) without also reporting an accounting rate-of-return measure.

is not one of bias; if accounting rate-of-return were simply biased upward because the denominator was too low, then the Compensation Committee could just raise the target level. Adjusting the target level will not alleviate the problems caused by a measure that does not reflect accurately the relation between earnings and the underlying (net) assets, and thus may not capture how managers' actions contribute to firm value.

I hypothesize that firms with high levels of internally developed intangible assets will avoid accounting rate-of-return measures because the balance sheet does not reflect fully the assets of the firm.⁵ Under U.S. generally accepted accounting principles, all costs related to internally developed intangible assets, such as brand names and patents, are charged to earnings as incurred. Although many argue that investing in advertising, R&D, and human capital helps create assets (probable future benefits), the AICPA Special Committee on Financial Reporting (1994) states that users generally oppose recognition of these assets, in part because no objectively reliable method determines their values. As a result, internally generated intangible assets that create significant wealth for the firm are not recognized on the balance sheet. Users of financial statements may consider the balance sheets of firms with high levels of unrecorded intangible assets to be less informative about the firm's prior investments than the balance sheets of other firms. The concern about the relevance of financial statements has increased as the economy has become more reliant on knowledge-based assets. Steven M.H. Wallman, a Commissioner of the U.S. Securities and Exchange Commission, stated:

Traditional financial statements are now significantly less reflective of the assets that create wealth than in times past. Intangible assets such as brand names, intellectual capital, patents, copyrights, expenditures for research and development, human resources, etc. are generating an increasing amount of our overall wealth.⁶

Compensation Committees may choose to incorporate nonaccounting performance measures in incentive plans. However, virtually all of my sample firms rely at least in part on accounting performance measures to determine annual bonuses for top executives. In this paper, my focus is on the choice between types of accounting measures; I do not address a possible shift from accounting measures to nonaccounting measures.⁷

Because expenditures related to internally developed intangible assets are expensed as incurred, the revenues from intangible assets are often reported in different accounting periods from the costs incurred to generate those assets. My tests focus on the reliance on or avoidance of accounting return measures; however, the *earnings* of firms with significant investments in intangible assets can also be a relatively poor measure of a manager's contribution to firm value during the year. The effect on earnings from investing in an intangible asset changes through the life cycle of the asset. During the early

⁵ Investments in intangible assets are only one reason why firms might choose to avoid rate-of-return measures. Other potential influences on accounting-performance-measure choice include regulatory restrictions on utilities which earn higher-than-expected rates of return.

⁶ Wallman (1996).

⁷ Research that explores the use of nonaccounting measures includes Bushman, Indjejikian, and Smith, (1996), who investigate firm and CEO characteristics associated with the weight placed on individual performance evaluation in CEO's annual incentive plans. Also, Ittner, Larcker, and Rajan (1997) examine how the relative use of nonfinancial and financial measures in executive bonus contracts varies with firm characteristics and strategies.

stages of an intangible asset's life, expenditures are large but revenues are small or zero; thus, earnings do not reflect the benefits of current expenditures to develop intangible assets. In contrast, a mature intangible asset produces revenues with little or no additional investment, causing earnings to reflect the benefits realized from investment decisions made in prior periods. If a firm is in a "steady state," earnings will be less affected by reporting in different periods the expenses associated with investments in intangibles and the revenues from those investments. My sample consists of large, established firms which I expect have both mature assets and assets in development. For these firms, I expect the value of reported earnings to be less affected than the value of reported assets by the immediate expensing of investments in intangibles. Consequently, for sample firms with high prior investments in intangible assets, I expect income-statement-based measures, such as sales and earnings, to be more reflective of executive performance than accounting rate-of-return measures, which rely on both the income statement and the balance sheet.

3. Related literature

My research question is related to several areas of literature. The first is research examining the relation between accounting performance measures and manager compensation. Several papers (including Jensen & Murphy, 1990; Lambert & Larcker, 1987; Sloan, 1993) investigate the sensitivity of executive compensation to stock returns and accounting performance measures. These studies find both types of measures are positively associated with executive compensation. However, the empirical tests of these studies use one accounting performance measure for all firms (usually return on equity [ROE], which incorporates both income statement and balance sheet information). My results might affect the interpretation of these studies if the relative sensitivity of executive compensation to stock return and accounting return measures is affected by the firm's choice of accounting performance measure.

Lambert and Larcker (1987) suggest that cross-sectional differences in the correlation between stock return and ROE affect the relative influence of stock return and accounting return measures on executive cash compensation. Lambert and Larcker find a lower correlation between ROE and stock return is associated with a higher relative weight on ROE and a lower relative weight on stock return.⁸ However, my results indicate the correlation between ROE and stock-return is lower for firms that do not rely on accounting rate-of-return performance measures.

Additional studies examine cross-sectional differences in the relation between compensation and firm performance. Ely (1991) uses a sample of firms from four diverse industries (banking, electric utility, oil and gas, and retail grocery) to document differences in the relation between CEO compensation and firm performance. She observes little evidence of differences across industries in four targets explicitly disclosed by firms: stock return, return on assets, net interest income, and revenues. Most of her sample firms with bonus plans use some form of return on assets (again, a measure incorporating both

⁸ See also Ittner, Larcker, and Rajan (1997), who find higher correlations between accounting return measures and annual market returns are associated with lower use of nonfinancial measures in executive bonus contracts.

income statement and balance sheet information). However, her only sample industry in which R&D or advertising would appear to be significant is oil and gas, where capitalization of exploration costs is permitted. In her analysis of the implicit relation between compensation and performance, she finds significantly different coefficients across her four industries when she regresses CEO salary and bonus amounts on stock return, ROA, and two industry-specific accounting measures used by analysts.

Clinch (1991) explores the relation between compensation contracts and levels of R&D expenditures, examining both cash compensation (salary plus bonus) and a measure of total compensation. He finds a stronger association between total compensation and both stock and accounting performance measures for high-R&D versus low-R&D firms, a result which appears to be driven by small firms. Again, Clinch uses a rate-of-return measure, ROE, as the accounting performance measure for all firms.

Bushman, Engel, Milliron, and Smith, (1998a) conclude that the importance of earnings relative to stock return in determining executive's cash compensation has declined over time. Bushman, Engel, Milliron, and Smith, (1998b) find the value-relevance of earnings and the presence of growth opportunities relative to assets in place are cross-sectional determinants of differences in the ratio of the sensitivities of earnings and stock market returns to cash compensation.

This paper also contributes to research investigating the value-relevance of financial statements of firms in technology-based industries. Lev and Zarowin (1999) find an increase (decrease) in R&D intensity (R&D/Sales) over time is associated with a decrease (increase) in earnings informativeness. Amir and Lev (1996) conclude financial statement information alone, without adjusting for the expensing of intangible assets or incorporating nonfinancial information, is largely irrelevant for the valuation of cellular companies. Aboody and Lev (1998) find the capitalization of software development costs is value-relevant to investors. Lev and Sougiannis (1996) provide evidence which suggests the capitalized value of investments in R&D (a measure not disclosed on financial statements) provides information to shareholders. They estimate the value of R&D capital for their sample firms and adjust the reported earnings and book value for the capitalization and amortization of R&D. They regress firm return on earnings before the adjustment for R&D capitalization and on the adjustment and find evidence the adjustment is value-relevant to investors.

4. Sample and data

The sample consists of 376 firms that have financial statement data on Compustat and compensation data on a Hewitt Associates LLC proprietary database representing the results from Hewitt Associates' 1987–1993 compensation surveys of public domestic companies. The surveys are mailed annually to participating firms, who divulge confidential information about the compensation of their executives and pay a fee to obtain results summarizing the information from all contributing firms. The data used in these tests are the firms' answers to the following question: "What financial measures are used to determine annual bonus plan awards to top corporate officers?" The firms provide a list or description of the performance measures used. Since many firms participate repeatedly in the survey, I use only one year's data from each firm to prevent unequal weighting. The sample comprises the first

observation for each firm,⁹ which was examined and assigned to one of two groups. The first group, which I call rate-of-return reliers, consists of firms that report the use of accounting rate-of-return measures, such as return on equity, or rate-of-return measures in combination with income statement or other measures (such as individual performance evaluation, customer satisfaction, or other nonfinancial measures). The second group, called rate-of-return avoiders, report the use of income statement measures alone or in combination with other performance measures, but no accounting rate-of-return measures.¹⁰ I exclude firms listing solely discretionary performance measures or those whose performance measures could not be classified.

Table 1 presents the distribution of performance measures across firms. Half the sample relies on only income-statement-based information to compute executive bonuses, while an additional 13% combine income-statement-based information with nonaccounting measures, such as individual performance evaluation or market share. Consistent with the findings of prior literature (Ely, 1991; Ittner, Larcker, & Rajan, 1997), I find stock return is not commonly used as a bonus plan performance measure. Only one firm in my sample reported using stock-market-based performance measures in conjunction with accounting performance measures.

Analysis (not reported) of the distribution of performance measures across the 48 two-digit SIC codes represented in the sample reveals that for firms with two-digit SIC codes above 50, including service firms and wholesale and retail merchandisers, rate-of-return avoiders outnumber rate-of-return reliers by over three to one. Rate-of-return avoiders also predominate in the chemicals (28) and machinery and computer equipment (35) industries. Companies in the food (20), transportation equipment (37), and electric and gas service (49) industries are roughly equally divided between the two groups.

Analysis of descriptive statistics (not reported) suggests the two subsamples have similar financial and compensation contract profiles. Rate-of-return avoiders and reliers do not differ significantly in median or mean levels of earnings, book value of equity, after-tax profit margin,¹¹ market value of equity, return on equity, or return on assets. The mean level of market/book¹² is significantly higher for the rate-of-return avoiders, but the two subsamples do not differ significantly in median level of market/book. Because of these results, I do not expect size or profitability to be a confounding factor in my tests.

Further analysis (not reported) indicates the subsamples have similar executive compensation policies; rate-of-return avoiders do not appear to formulate the remainder of the contract to counterbalance the lack of a return metric in the bonus plan. The subsamples do not differ significantly in the percentage of total compensation from the annualized value of grants of stock-based compensation, the percentage of total

⁹ Each year, the survey respondents are provided with the firm's prior year's response and may neglect to update the response to reflect changes in the performance measures used. Therefore, I believe using each firm's earliest response to the survey reduces measurement error.

¹⁰ The power of my tests may be reduced if firms fail to report the implicit use of rate-of-return performance measures in determining executive bonuses. For example, a firm might report that the CEO bonus is based on earnings per share, but neglect to mention that no executive will receive a bonus unless return on equity exceeds a certain level. Alternatively, the firm could report the bonus is based only on earnings, but neglect to mention that the target level of earnings is set according to the firm's accounting rate of return.

¹¹ After-tax Profit Margin = Income before Extraordinary Items/Sales(Net).

¹² Market/Book = Shares of Common Stock Outstanding_{*i*} * Market Price Per Share_{*i*} / Shareholders' Equity_{*i*}.

Table 1

Distribution of bonus plan performance measure types ($n=376$)

Performance measures	No accounting rate-of-return performance measures (%)	Accounting rate-of-return performance measures (%)
Income statement only, e.g. EPS, Pre-tax profits, Earnings	50.0	
Accounting rate of return only, e.g. ROA, ROE, ROIC		13.3
Both income statement and accounting rate of return	–	16.8
Income statement plus other measures, e.g. discretion, market share, individual performance	12.8	
Accounting rate of return plus other measures		3.7
Both income statement and accounting rate of return, plus other measures		3.5
Total	62.8	37.3

The sample comprises one observation per firm from 376 public domestic companies that have financial data on Compustat and that reported bonus plan performance measures to Hewitt Associates LLC at least once during 1987–1993.

compensation due to the annualized value of option grants, the percentage of total cash compensation due to the bonus, and the percentage of total compensation due to the bonus.

5. Identifying firms with significant investments in intangible assets

To test my hypotheses, I need to identify firms whose primary businesses involve creating and employing brand equity, patents and copyrights, or human capital. Because internally generated intangible assets are not presented on financial statements, I must use a proxy to distinguish firms with significant investments in these assets. Two possibilities are a measure of the level of a firm's intangible assets and a measure of the investments that create those intangible assets. For my tests, I first use market/book as a measure of the level of the firm's intangible assets, and examine whether the level of a firm's market/book ratio is associated with its choice of accounting performance measure in the executive bonus plan. I define market/book as (Shares of Common Stock Outstanding_{*t*} * Market Price Per Share_{*t*})/Shareholders' Equity_{*t*}. I then developed a proxy based on the firm's investments in three types of intangible assets: brand value, human capital, and R&D-related assets. By basing my proxy on the firm's investments in intangible assets, I can investigate whether the presence of specific types of intangible assets is related to the choice of bonus plan performance measure.

Firms develop copyrights, patents, and other R&D-related intangible assets through research and development expenditures, which are expensed as incurred in accordance with SFAS 2. To identify firms with significant unrecorded R&D-related assets, I sort the sample observations on the current year's R&D expense deflated by total assets.¹³ Firms are not required to disclose R&D if the expenditure is less than 1% of sales; therefore,

¹³ The results of my tests do not change when 3- or 5-year-average ratios are used to determine the HIINTAN proxy.

unreported R&D expense is treated as equal to zero. The reporting of R&D expense at low levels may be noisy because some firms may report voluntarily R&D expense when it is below the 1% threshold. However, I wish to identify only those firms for which investing in R&D is a substantial activity. I therefore designate observations in the highest two deciles of R&D Expense/Total Assets as $HI_RD=1$. The remaining firms are designated $HI_RD=0$.¹⁴ Panel A of Fig. 1 illustrates that most of the observations have a zero or low ratio of R&D/Total Assets.

Similarly, firms with significant investments in brand value support their brands with advertising. I resort the sample firms by the ratio of advertising expense to total assets, and designate the firms in the highest two deciles of the current year's advertising expense deflated by total assets¹⁵ as firms likely to have unrecorded brand value ($HI_ADV=1$). Again, unreported advertising expense is treated as equal to zero. The graph is similar to Panel A of Fig. 1 and is not presented.

One characteristic of firms with significant human capital is the ability to generate revenues with lower physical assets than other firms. The sample contains only ten firms with a primary SIC code in service industries (defined as SIC code 7000 or greater) but may contain other firms that are similarly able to generate revenues from low levels of physical assets. Ratios such as return on invested capital are less meaningful for firms with little invested capital; accordingly, these firms may choose to avoid rate-of-return performance measures. To identify firms which are or behave like service firms, I designate companies in the lowest two deciles of (Gross Property, Plant and Equipment+Inventory)/(Total Assets+Accumulated Depreciation) of my sample as $LO_PPE=1$. Panel B of Fig. 1 contains the graph of (Gross Property, Plant and Equipment+Inventory)/(Total Assets+Accumulated Depreciation) for the sample observations.¹⁶

Firms with probable R&D-related unrecorded assets ($HI_RD=1$) or brand value ($HI_ADV=1$), or firms with low physical assets employed ($LO_PPE=1$) are designated as $HIINTAN=1$ firms, with the remaining firms designated $HIINTAN=0$. Examination (not reported) of the distribution of $HIINTAN$ across two-digit SIC codes reveals that, as might be expected, the $HIINTAN=1$ firms are concentrated in industries such as 20 (foods), 28 (chemicals, including pharmaceuticals), 35 (machinery and computer equipment), and 38 (measuring instruments and photographic equipment).

Table 2 presents descriptive statistics for the subsamples of $HIINTAN=0$ or 1. Not surprisingly, both mean and median market/book are significantly higher for $HIINTAN=1$ firms. The subsamples have similar mean and median levels of earnings and after-tax profit margin, book value of equity, and market value of equity.¹⁷

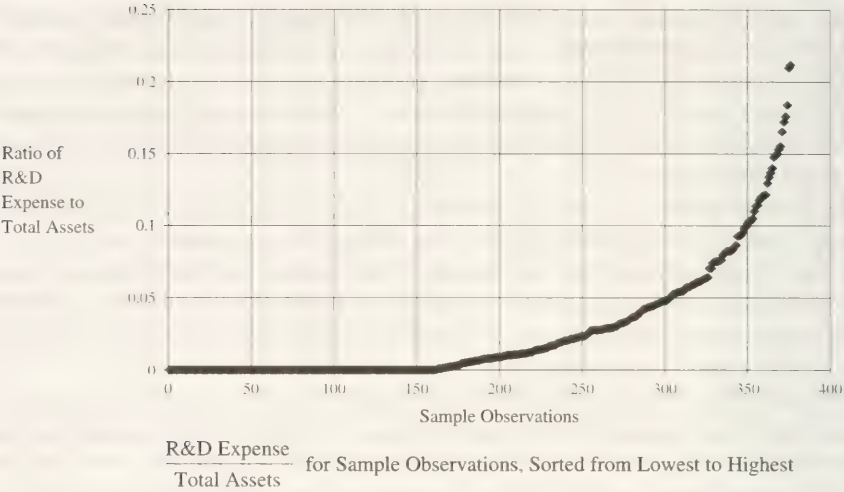
¹⁴ Because Compustat Research and Development expense excludes exploration and development expenses for extractive industries, I may be misclassifying some $HI_RD=1$ firms as $HI_RD=0$. This biases my tests against my hypotheses.

¹⁵ Advertising is deflated by total assets rather than sales because firms often budget advertising expenditures based on the desired ratio of advertising/sales.

¹⁶ I also performed all tests using (Net PP&E - Inventory) Total Assets to determine LO_PPE ; results are quantitatively similar.

¹⁷ After-tax Profit Margin = Income before Extraordinary Items Sales (Net); Market Book = [(Share Common Stock Outstanding_{*t*} * Market Price Per Share_{*t*}) + Book Value of Debt_{*t*}] (Shareholders' Equity_{*t*} - Book Value of Debt_{*t*} + Accumulated Depreciation_{*t*} - Purchased Goodwill_{*t*}).

Panel A:



Panel B:

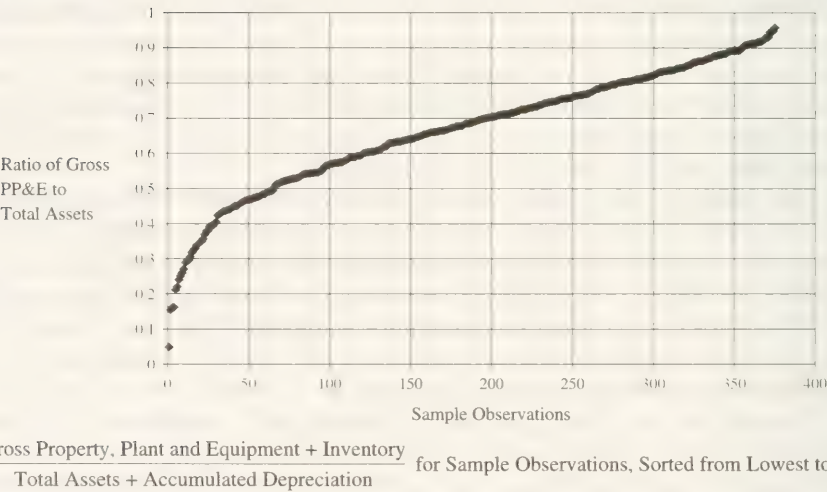


Fig. 1. Distribution of measures of R&D and human capital intensity across sample observations. Panel (A) Distribution of R&D intensity across sample observations. Panel (B) Distribution of human capital intensity across sample observations.

I also find the HIINTAN=1 firms have a significantly higher percentage of total compensation from the annualized value of option grants (OPTION%), and a significantly higher percentage of cash compensation in the form of a bonus (BONUS%). Further tests (not reported) reveal the results for OPTION% are driven by HLRD firms, while the results for BONUS% are from the HI_ADV and LO_PPE firms. There is no difference across subsamples in the percentage of cash bonus to total

compensation. These results support prior work by Gaver and Gaver (1993) and Smith and Watts (1992) who investigate, at the firm and industry levels, respectively, whether growth firms are more likely to rely on market-based incentive plans because managerial actions are less observable in these firms. Gaver and Gaver construct a growth measure based in part on R&D expense, and find growth firms pay higher levels of cash compensation and have a higher incidence of option plans than nongrowth firms. Clinch (1991) finds high R&D firms use more option-based compensation plans than low R&D firms do.

6. Accounting performance measure choice and the firm's expected level of investments in intangible assets

In this section, I investigate whether the Compensation Committees of firms with high levels of investments in intangible assets, such as internally developed patents or copyrights, brand names, or human capital, avoid accounting rate-of-return measures in executive bonus plans. First, I analyze whether a firm's level of market/book is related to its choice of bonus plan performance measure. Second, using the HIINTAN proxy developed in Section 5, I identify sample firms with large levels of investments in internally generated intangible assets related to advertising, to R&D, and to human capital. I then compare, using contingency tables and LOGIT regressions, the type of bonus plan performance measures used by firms identified by the proxy as having significant investments in unrecorded intangible assets with the type of bonus plan performance measures used by the remainder of the sample firms.

To analyze whether firms with high levels of intangible assets, as proxied by market/book ratio, avoid rate-of-return measures in the bonus plans of corporate executives, I perform LOGIT regressions of performance measure type on market/book, before and after controlling for firm growth and amount of purchased intangible assets. I then focus on firms with high investments in internally generated intangible assets with a contingency table analysis of HIINTAN versus performance measure type. To examine the individual effects of each type of intangible asset in the presence of the others, I perform LOGIT regressions of performance measure type on the intangible asset dummy variables, both alone and after controlling for firm growth and amount of purchased intangible assets.

I hypothesize high market/book and HIINTAN firms choose income-statement-based performance measures over accounting rate-of-return measures because the balance sheet does not reflect the investments in internally developed intangible assets. However, some companies may select performance measures based only on income statement information in order to encourage firm growth. Firm value is created by establishing a rate of return on investments above the firm's cost of capital, and by taking advantage of growth opportunities. Firms wishing to encourage management to pursue high growth may emphasize income statement performance measures, which capture growth, over rate-of-return measures. Accordingly, I designate $GROWTH=1$ firms as those firms which experience positive real growth

in sales from year $t-1$ to year $t+1$. I hypothesize firms experiencing positive real growth (GROWTH=1) will be more likely to avoid accounting rate-of-return measures in executive bonus plans.

Table 2
Sample firm descriptive statistics

	HIINTAN=0	HIINTAN=1	<i>p</i> -value
<i>Book value of equity (\$M)</i>			
Median	974	730	.24
Mean	2075	2161	.86
Standard deviation	3734	4799	
<i>Earnings (\$M)</i>			
Median	84.00	89.05	.47
Mean	186.47	256.38	.30
Standard deviation	666.92	505.03	
<i>Market value of equity (\$M)</i>			
Median	1534	1603	.52
Mean	3587	4014	.59
Standard deviation	7490	6540	
<i>Market/Book</i>			
Median	1.618	1.978	.000
Mean	1.958	2.474	.031
Standard deviation	2.316	1.879	
<i>After-tax profit margin</i>			
Median	0.043	0.051	.28
Mean	0.045	0.055	.15
Standard deviation	0.067	0.062	
<i>STOCK%</i>			
Median	.300	.306	.58
Mean	.298	.319	.38
Standard deviation	.206	.213	
<i>BONUS/CASH%</i>			
Median	.316	.380	.004
Mean	.284	.325	.034
Standard deviation	.260	.181	
<i>BONUS/TOTAL%</i>			
Median	.192	.205	.153
Mean	.189	.209	.247
Standard deviation	.119	.143	
<i>OPTION%</i>			
Median	.170	.221	.011
Mean	.187	.246	.006
Standard deviation	.168	.193	

Table 3
Results of LOGIT regressions of performance measure type on market/book

Panel A: $ROR_i = \alpha + \beta_1 MB_i + \varepsilon_i$ ($n = 347$)

	α	β_1
Coefficient	-.087	-.185
S.E.	.207	.088
Prob > χ^2	.673	.036

Panel B: $ROR_i = \alpha + \beta_1 MB_i + \beta_2 RECGW_i + \beta_3 GROWTH_i + \varepsilon_i$ ($n = 337$)

	α	β_1	β_2	β_3
Coefficient	-.031	-.159	-.253	-.078
S.E.	.236	.085	.299	.237
Prob > χ^2	.896	.059	.397	.743

Variable definitions:

ROR=1 if the firm reports the use of accounting rate-of-return performance measures in executive bonus plans, and 0 otherwise

$MB = [(Shares\ Common\ Stock\ Outstanding_i * Market\ Price\ Per\ Share_i) + Book\ Value\ of\ Debt_i] / [Shareholders' Equity_i + Book\ Value\ of\ Debt_i + Accumulated\ Depreciation_i - Purchased\ Goodwill_i]$

RECGW=1 if observation is in the top 2 deciles of $[Unamortized\ Intangible\ Assets_i + Deferred\ Charges_i] / Total\ Assets_i$ for the sample firms

SALESGR=3-year real growth (years $t-1$ to $t+1$) in sales.

Some companies may have low ratios of (Gross Property, Plant and Equipment + Inventory)/(Total Assets + Accumulated Depreciation) because of high levels of purchased goodwill. Ceteris paribus, I expect a larger portion of the investment in intangible assets to be reflected accurately on the balance sheet of a firm with purchased, as opposed to internally developed, intangible assets. To examine whether the presence of purchased intangible assets affects the relation between HIINTAN=1 and choice of bonus plan performance measure, I sort the sample firms by the ratio

Notes to Table 2:

P-values are from parametric *t*-test (mean) and nonparametric Mann-Whitney *U*-test (median).

Variable definitions:

HIINTAN=1 if observation is in the highest two deciles of R&D Expenses/Total Assets or Advertising Expense/Total Assets or the lowest two deciles of (Gross PP and E + Inventory)/(Total Assets + Accumulated Depreciation) for the sample firms, and 0 otherwise

After-Tax Profit Margin=Income before Extraordinary Items/Sales (Net)

Market/Book=[(Shares of Common Stock Outstanding_{*i*}*Market Price Per Share_{*i*})+Book Value of Debt_{*i*}]/[Shareholders' Equity_{*i*}+Book Value of Debt_{*i*}+Accumulated Depreciation_{*i*}-Purchased Goodwill_{*i*}]

Stock₀%=annualized value of grants of stock-based compensation as a percentage of total compensation

BONUS%=Bonus/(Bonus+Salary)

OPTION%=annualized value of option grants as a percentage of total compensation.

Table 4

Contingency tables of performance measure type by firm type

Firm type	HIINTAN=0	HIINTAN=1	Total
<i>No rate-of-return performance measures</i>			
Frequency	116	120	236
Expected frequency	132.44	103.56	
Cell χ^2	2.04	2.61	
<i>Rate-of-return performance measures</i>			
Frequency	95	45	140
Expected frequency	78.56	61.44	
Cell χ^2	3.44	4.40	
<i>Total</i>	211	165	376

Total χ^2 : 12.48.

P-value: .001.

Variable Definitions:

HIINTAN=1 if observation is in the highest two deciles of R&D Expense/Total Assets or Advertising Expense/Total Assets or the lowest two deciles of (Gross PP and E + Inventory)/(Total Assets + Accumulated Depreciation) for the sample firms, and 0 otherwise.

of unamortized intangible assets and deferred charges to total assets,¹⁸ and designate firms in the top two deciles as RECGW = 1. I expect firms with purchased intangible assets (RECGW = 1) will be more likely to rely on accounting rate-of-return performance measures in executive bonus plans.

Panels A and B of Table 3 present the results from the LOGIT regression of accounting performance measure choice on market/book. The dependent variable of the regression, ROR, is set equal to one for firms that report the use of accounting rate-of-return performance measures in executive bonus plans, and set equal to zero otherwise. The regression in Panel A is run using 347 observations because 29 observations do not have the Compustat data necessary to compute the firm's market/book ratio, or have negative market/book ratios. An additional ten observations have insufficient data to compute GROWTH, so the regression in Panel B is run on 337 observations. The coefficient on market/book is negative and significant before and after controlling for GROWTH and RECGW, suggesting firms with intangible assets are less likely to rely on accounting rate-of-return performance measures in the bonus plans of corporate executives.

Table 4 presents contingency tables of HIINTAN versus performance measure type. Firms identified as likely to have high unrecorded intangible assets (HIINTAN=1) rely significantly less often on rate-of-return performance measures and significantly more often on only income-statement-based measures in their bonus plans than would be expected if these choices were independent. HIINTAN=0 firms are significantly more likely to choose rate-of-return performance measures and significantly less likely to select measures based on only income statement information than would be expected if these choices were independent. The chi-squared statistic for the table is significant at the .001 level.

¹⁸ Compustat data items (33+152)/6.

Panel A of Table 5 presents the results from the LOGIT regression of accounting performance measure choice on HIINTAN. Nineteen observations do not have the four consecutive years of sales data on Compustat required to compute GROWTH; therefore, the regressions are based on the remaining 358 observations. The coefficient on HIINTAN is negative and highly significant, suggesting firms with high levels of unrecorded intangible assets are less likely to rely on accounting rate-of-return as a CEO bonus plan performance measure, before and after controlling for GROWTH and RECGW. As shown in Panel B of Table 5, when ROR is regressed on the individual types of expected unrecorded intangible assets, both HLRD and LO_PPE have negative and highly significant coefficients while HLADV is insignificant. The coefficients on HLRD and LO_PPE retain their significance after controlling for firm growth and unamortized purchased intangible assets (Table 5 Panel C). The coefficient on GROWTH is positive but insignificant; the coefficient on RECGW is negative but insignificant.

Table 5
Results of LOGIT regressions of performance measure type on firm type ($n=358$)

Panel A: $ROR_j = \alpha + \beta_1 HIINTAN_j + \beta_2 RECGW_j + \beta_3 GROWTH_j + \varepsilon_j$

	α	β_1	β_2	β_3
Coefficient	-.221	-.759	-.306	.140
S.E.	.190	.236	.301	.237
$Prob > \chi^2$	.247	.001	.309	.556

Panel B: $ROR_i = \alpha + \beta_1 HLRD_i + \beta_2 HLADV_i + \beta_3 LO_PPE_i + \varepsilon_i$

	α	β_1	β_2	β_3
Coefficient	-.189	-.761	-.178	-.876
S.E.	.136	.307	.294	.329
$Prob > \chi^2$	.166	.013	.545	.008

Panel C: $ROR_i = \alpha + \beta_1 HLRD_i + \beta_2 HLADV_i + \beta_3 LO_PPE_i + \beta_4 RECGW_i + \beta_5 GROWTH_i + \varepsilon_i$

	α	β_1	β_2	β_3	β_4	β_5
Coefficient	-.223	-.803	-.194	-.822	-.280	.138
S.E.	.189	.311	.302	.334	.308	.240
$Prob > \chi^2$	.237	.010	.520	.014	.363	.567

Variable definitions:

ROR=1 if the firm reports the use of accounting rate-of-return performance measures in executive bonus plans, and 0 otherwise

HIINTAN=1 if HLRD=1 or HLADV=1 or LO_PPE=1

RECGW=1 if observation is in the top 2 deciles of [Unamortized Intangible Assets + Deferred Charges] Total Assets of the sample firms

GROWTH=1 if firm has positive 3-year real growth (years $t-1$ to $t+1$) in sales

HLRD=1 if observation is in the top 2 deciles of R&D Expense/Total Assets of the sample firms

HLADV=1 if observation is in the top 2 deciles of Advertising Expense/Total Assets of the sample firms

LO_PPE=1 if observation is in the lowest 2 deciles of (Gross Property, Plant and Equipment + Inventory) (Total Assets + Accumulated Depreciation) of the sample firms.

I also performed the contingency analyses and LOGIT regressions defining HIINTAN with alternative measures for advertising and R&D expense. If, as I hypothesize in Section 2, my sample firms are in a steady state with respect to advertising and R&D expenditures, then current expenditures should approximate the amount of intangible capital consumed during the year. I adjusted both the expenses and the total assets of each firm to reflect the capitalization of advertising and R&D expenditures. I amortized advertising over 3 years and R&D over 7 years, following Hirschey and Weygandt (1985), who conclude that the “life” of advertising is 1–5 years, while the “life” of R&D is 5–10 years. Because of the time-series of data required, the sample is reduced to 316 observations. Results (not reported) for contingency tables and for the LOGIT regression from Panel A of Table 5 are quantitatively similar. Results from the LOGIT regressions from Panels B and C of Table 5 are less statistically significant than from regressions using current advertising and R&D expense to determine HIINTAN.

The results suggest investments in R&D create intangible assets that make rate-of-return measures less useful for purposes of performance evaluation. Investments in other intangible assets, such as human capital, as measured by the LO_PPE proxy, also relate to avoidance of rate-of-return performance measures. The insignificant coefficient on HL_ADV may be due in part to the nature of the relation between advertising expense and brand value. While R&D expenditures associated with a particular technology or product usually decline dramatically once the new technology or product is created, advertising expenditures on established brands is often significant (e.g. Coca-Cola and McDonald’s). As a result, advertising expense is an imperfect measure of investment in brands, because a portion of reported advertising expenditures is used to “maintain” established brands rather than to invest in new-brand value.

7. Conclusions

The evidence I provide suggests that firms’ choices of CEO bonus plan accounting performance measures vary in a predictable manner. I find that the presence of high levels of investments in intangible assets is associated with a firm’s choice to avoid accounting rate-of-return performance measures in executive bonus plans. The results hold for my proxies for both R&D-related assets and service firms, but not for advertising-related assets, and my results are insensitive to controlling for firm growth and for the presence of purchased goodwill.

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Irrational investor response to stock splits in an emerging market[☆]

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Abstract

Using the creation and collapse of the Cyprus stock market bubble as a backdrop, we document substantial positive abnormal returns around the announcement and execution of stock splits in Cyprus. Split-induced returns cannot be explained by variables proxying for conventional liquidity and signalling hypotheses for stock-split activity. Positive split-induced returns are largely reversed in the post-split months. Post-split stock underperformance is inversely related to, and thus appears to be a correction for, the significant market overreaction at split execution. We suggest an investor irrationality explanation for these results, arguing that stock splits were associated with the creation of the bubble due to the inability of investors to understand splits correctly. We conclude that educating investors in emerging markets to process information correctly will improve the efficiency of such markets.

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1. Introduction

In this paper, we attempt to shed light on investor irrationality by studying investor behavior in the emerging Cyprus Stock Exchange (CSE). The CSE has been extensively discussed in the international financial press for its erratic behavior in recent years. Notably, the CSE Index rose from 97 points on January 1, 1999, to 852 points on December 1, 1999, gradually descending back to 103 points by September 30, 2001. The CSE, classified in the broad category of emerging markets, provides an interesting setting for studying investor irrationality because its youth and the relative inexperience of its market participants makes irrational investor behavior more likely.¹ Further, its recent astonishing roller-coaster type movement provides a fertile ground for such an investigation.

Specifically, in this paper, we focus on stock splits as one mechanism that may have contributed to irrational investor behavior and the unprecedented boom and bust. Using event-study methods, we initially document considerable abnormal returns around the announcement and execution of stock splits in Cyprus. We also find that one year after the execution of splits, splitting firms severely underperform the already declining market. Importantly, the highly positive returns on the split execution day are not correlated with factors proxying for conventional explanations for stock-split activity. Instead, they are negatively related to post-split underperformance, suggesting that splitting firms clearly beat the market on the way to the top, but are severely beaten by the market on the way down.²

We believe that the contribution of this paper is twofold: first, we provide empirical evidence about the market assessment of stock splits in an emerging market. It is not clear *ex ante* how traditional explanations for stock-split activity coming from developed markets, based on information signaling and liquidity arguments, apply to developing markets that are less liquid and exhibit greater information asymmetry between managers and shareholders.

Second, our empirical results are sufficiently distinct in that our results are consistent with the notion that stock splits have contributed to the creation of a stock market bubble, because stock price performance of splitting firms was both statistically and economically distinct from the overall market performance. The magnitude of the market reaction is much stronger than the split-induced market reaction documented in developed markets. Further, the long-term market underperformance of splitting firms that we document in the present study is unprecedented. Thus, our study illuminates an interesting set of empirical regularities that are very different from findings observed in developed markets.

The study proceeds as follows: Section 2 provides some background on the CSE. Section 3 briefly reviews the literature and presents our expectations. Section 4 discusses

¹ More sophisticated foreign investors could not counterbalance such overvaluation because of regulation prohibiting short-selling. Cyprus Stock Exchange statistics show that the trading volume by foreign investors at the time was less than 10% of the total stock market trading volume.

² For an illustration of the rise and fall of the CSE and the occurrence of splits see Fig. 1.

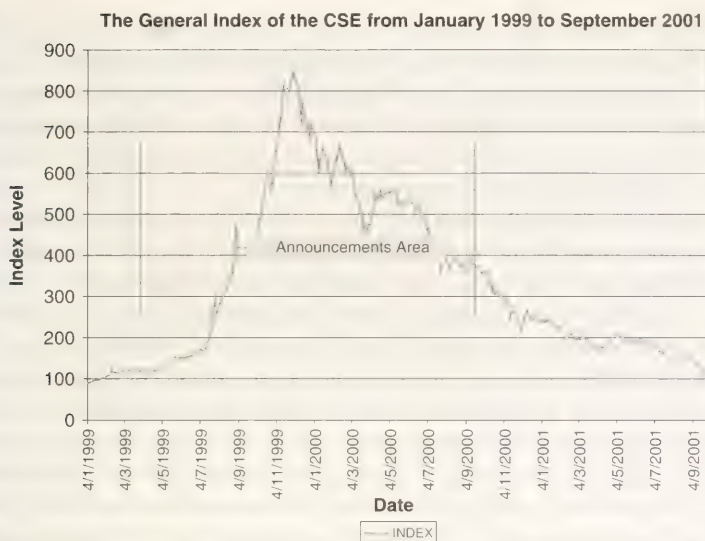


Fig. 1. Movement of the Cyprus stock exchange general index. This figure shows graphically the movement of the general index of the Cyprus Stock Exchange from January 1999 to September 2001. The barriers indicate the area where all the stock-split announcements took place.

the data and methods, Section 5 presents the results, and Section 6 provides concluding remarks.

2. Background

A form of stock exchange has been in operation in Cyprus since the early 1980s in an over-the-counter setting through dealers and brokers, but without a proper institutional framework (Vafeas, Trigeorgis, & Georgiou, 1998). Some monitoring of this process was provided by the Cyprus Chamber of Commerce and Industry (CCCI), and no specialists or official market makers were employed during this period (Travlos, Trigeorgis, & Vafeas, 2001). Because of the small number of informed market participants who were involved during this period, prices appeared to be set “rationally” with no apparent evidence of anomalies. Starting on March of 1996, the official Cyprus Stock Exchange (CSE) was launched by the Cypriot government. Since then, regular auction-type meetings are held daily, five times a week for 90 minutes per day, making a significant step toward improving the efficiency of the market. During the first 3 years of its operations, the CSE attracted little interest, with average daily trading volumes around half a million U.S. dollars and the index ranging from 74 to 105 points.³ During this period, political concerns over the divided island’s future reinforced investor cautiousness.

By April 1999, the first stock split ever was recorded by a CSE firm. By late August, the number of firms announcing stock splits had reached 14. As shown in Fig. 1, at about

³ On March 16th, 2004, one Cyprus pound equaled about 2.10 U.S. dollars.

this time, the index started rising steadily; the index rose eightfold in less than one year as more people converted their life savings into securities. More than 150 firms applied for listing at the CSE within a year, twice the number that was traded at the CSE up to that time. IPOs were routinely oversubscribed dozens of times over. Nevertheless, following initial excitement, the index gradually, but unmistakably and inevitably, descended to its prior level, losing nearly 90% from its peak value.

In an attempt to mitigate the problems created by the huge drop in the CSE index, several actions were taken by the CSE and the Government of Cyprus. An expert team was called in from Greece to examine the problems and suggest corrective actions, an investigative committee was appointed by the President of the Republic of Cyprus to determine who was to blame, and parliamentary committees routinely made suggestions on various aspects of the problem. Suggested measures included approving legislation for the creation of open-end mutual funds, setting up an administrative agency to mitigate differences between banks and investor-debtors, setting up a “guarantee” fund managed by a foreign organization to ensure stability in the CSE, investing money from public pension funds in the CSE, improving the quality of financial reports provided in the prospectuses of start-ups, and lastly, approving a corporate governance code for firms that are listed in the CSE.

3. Literature review and expectations

In this section, we review the academic literature on stock splits and discuss investor irrationality as an explanation for the market response to stock splits.

3.1. Review of the literature

The positive stock market reaction to stock-split announcements in the United States has been well established by numerous studies starting with the seminal work of Fama, Fischer, Jensen, and Roll (1969).⁴ Much of the later work focused on understanding the reasons for the positive market reaction to split announcements. The predominant explanation is that splits serve as a credible signal about firm value that is conveyed by management to less informed investors. The split announcement bridges the gap in informational asymmetry leading investors to revise their estimate of firm value upward (e.g., Asquith, Healy, & Palepu, 1989; McNichols & Dravid, 1990). A second explanation is that stock splits move the firm’s trading price to a more attractive range, thus increasing its liquidity (Lakonishok & Lev, 1987; Lamoureux & Poon, 1987). Greater liquidity lowers the firm’s cost of capital. Therefore, splits that induce higher liquidity and may potentially lower the firm’s cost of capital are favorably assessed by market participants.

Evidence from the U.S. also suggests that the split execution day is associated with positive abnormal returns (e.g., Grinblatt, Masulis, & Titman, 1984; Maloney & Mulherin, 1992). Maloney and Mulherin (1992) attempt to link the ex-day returns to market

⁴ Also see, for example, Grinblatt et al. (1984), Fama et al. (1969), Lakonishok and Lev (1987), and Maloney and Mulherin (1992) also find that stock splits follow a period of abnormal equity appreciation.

microstructure phenomena. In a similar vein, Muscarella and Vetsuypens (1996) explore splits of ADRs that are not associated with splits in their home country. They are, thus, able to separate information from liquidity effects. They conclude that splits increase liquidity both in the number of trades and total volume of shares traded. In contrast, Copeland (1979) and Conroy, Harris, and Benet (1990) document liquidity declines following stock splits. In sum, U.S. evidence suggests that both the announcement and execution of splits elicit a favorable market response. For split announcements that response has been partly explained by information, and to a lesser extent, by liquidity considerations. Ex-day returns are partly explained by liquidity considerations.

Studies in other settings generally document similar results. For example, Wulff (1999) focuses on splits in Germany and documents small, positive returns around split announcement and execution. He argues that his results are unlikely to be explained by information signaling or liquidity effects. Instead, they are more consistent with a neglected-firm explanation according to which firms split their stock to elicit public attention. Wu and Chan (2000) study stock splits and reverse stock splits in Hong Kong. They find positive abnormal returns at the announcement of stock splits that can be explained well by an “optimal price range” or liquidity variable. Studying stock dividends in Cyprus between 1985 and 1994, Travlos et al. (2001) document small, positive returns that cannot be explained by liquidity or signaling variables.

3.2. Investor irrationality as an explanation for the market response to stock splits

In our paper, we initially examine the market reaction to stock-split announcements focusing on the Cyprus setting. Following prior work, and guided by casual observation, we examine whether the market reaction to split announcements is positive. Second, we study the market reaction to the execution of stock splits. As discussed earlier, prior research has suggested that signaling and liquidity considerations are expected to result in positive split-induced returns. Third, we proceed to explain the cross-sectional variation in announcement – and execution – day returns. We construct variables proxying for the information and liquidity effects of splits and attempt to identify the effects contributing to the way Cypriot investors respond to stock splits. In particular, the split factor, trading volume, share price, and pre-split stock performance are used to capture the cross-sectional variation in split-induced returns.⁵

Fourth, we suggest and test an additional, previously unidentified explanation for split-induced returns based on investor irrationality. Specifically, unsophisticated investors fail to understand the fundamental mechanics of a split, behaving as if a split results in a multiplication of firm value. Substantial positive returns are expected at the announcement of the split by investors “looking forward to receiving many shares in exchange for one,” and on the execution day, when this “gift” finally materializes. During 1999, there was an overwhelming infusion of funds into the CSE by ignorant and unsophisticated investors.

⁵ Volume ratio is the trading volume in number of shares for firm *i* divided by the number of shares outstanding over the 50-day pre-announcement trading period (–110, –61). Split factor is the number of common shares outstanding after the stock split divided by the number of common shares outstanding before the split.

raising the daily volume of trade from one million Cyprus pounds at the end of 1998 to over 100 million at the peak of this phenomenon in late 1999. Thus, there was tremendous demand for the stocks of splitting firms, bidding their share prices to great heights.

Importantly, no short-selling is allowed by the Cyprus Stock Exchange. Therefore, a rational investor could not profit from this behavior by selling the inflated shares around the split to deliver at a future date. This irrationality in investor behavior is partly offset by the few rational shareholders selling the splitting firms' stock either directly or indirectly (e.g., by cashing in on their grossly overpriced pension funds that happened to include a few firms that were splitting their stocks over this period). Importantly, even if short sales were allowed, it was unclear at the time how long this bubble would last, and shorting a stock would not have guaranteed any gains. Indeed, it took nearly three years for the index to come full circle (see Fig. 1).

Thus, consistent with investor irrationality described above,

Hypothesis 1. Splitting firms are expected to experience significantly positive market- and risk-adjusted returns around split announcement and execution.

Further, as the market became wiser in processing information and the market index was deflated, we expect that splitting firms would have suffered the consequences of this run-down more severely than non-splitting firms.⁶ Thus,

Hypothesis 2. There is a long-run market underperformance by the splitting firms in the post-split period.

Given that most investment decisions in the CSE at the time were not driven by fundamentals, the value of traditional explanations for stock-split activity is an open empirical question. We explore this notion empirically.

Hypothesis 3. Liquidity and information-signaling proxies are associated with the stock market reaction to the announcement and execution of stock splits.

Our fourth and last expectation is that the degree of underperformance following the split is inversely related to the market reaction to splits; i.e., the greater investor irrationality had been at the split announcement and execution (as measured by the market reaction), the greater the price decline would be in the following months. Thus,

Hypothesis 4. There exists an inverse relation between the stock market response to split announcement and execution and the post-split underperformance of splitting firms.

4. Data and methodology

Next, we describe the data sources and data collection procedures, and briefly outline the event-study methods used to analyze that data.

⁶ Notably, the post-split underperformance that we hypothesize in Cyprus is in direct contrast to evidence on post-split overperformance from the U.S. stock market (e.g., Desai & Jain, 1997).

4.1. The data

Stock-splitting firms were identified and selected from two Cypriot financial newspapers: *Financial Mirror* and *Neos Typos*. The split announcement and execution days were identified from the official database of the Cyprus Stock Exchange and were confirmed by the *Stockwatch* financial web page, the main provider of news on the Cyprus Stock Exchange over the Internet. Information on the split factors is also collected from the same sources. The announcement day ($t=0$) is the first day the information becomes publicly available. Even though firms in the CSE use the terms stock split and stock dividend irrespective of the split factor (depending on the accounting treatment of the paper transaction), we define stock splits as all transactions with a split factor of at least 1.25, given that smaller splits are effectively stock dividends. Our final sample comprises 45 splits that took place in 1999 and 2000 (all of which took place between April 1999 and October 2000). Importantly, splits were practically an unknown instrument to Cypriot investors until that time, given that no stock splits had ever occurred in Cyprus before April 1999. Further, only one split occurred within 36 months from the end of our sample period, suggesting that, in this study, we essentially use the population of stock splits by Cypriot firms to date.

Information on daily stock prices, daily trading volumes, and the stock market index are also collected from the CSE official web page. For the post-split period, stock prices and trading volumes are adjusted by the split factor. Stock prices and volumes are also adjusted for other corporate issues such as stock bonuses and rights issues that occurred throughout the period under examination.

4.2. Methodology

To measure stock performance around the announcement and execution of splits, we use standard event-study methods. Given the highly erratic behavior of the market over this period, the stationarity of firm betas is questionable. Thus, we initially measure abnormal return as the difference between actual return and market return (market-adjusted return). Results from tests on market-adjusted returns are reported throughout the paper. We alternatively estimate daily abnormal return as the difference between actual and expected return, where expected return is estimated using the one factor market model. The parameters α and β of that model are estimated over the 100-day trading period from -160 to -61 days before the stock-split announcement. Returns are then accumulated and their statistical significance is tested using the standard method described in Travlos et al. (2001). Results from this method (not tabulated) are qualitatively similar to results on market-adjusted returns reported here.⁷

5. Results

Fig. 2 presents graphically the pattern of market-adjusted returns around the stock-split announcement (panel A) and the stock-split execution (panel B). Focusing first on panel

⁷ Additional tests focusing on raw returns provided (untabulated) results similar to those reported in this paper.

A Cumulative market-adjusted returns (CMAR) around stock split announcements**B Cumulative market-adjusted returns (CMAR) around split execution**

Fig. 2. Cumulative market-adjusted returns (CMAR) around the announcement and execution of stock splits. Panel (A) shows graphically the average cumulative market-adjusted returns across the 45 splitting firms from trading day -60 to trading day $+10$, where the benchmark trading day 0 is the stock-split announcement date. Panel (B) shows graphically the average cumulative market-adjusted returns across the 45 splitting firms during and after the execution day. The selected area refers to trading days -10 to $+210$ (the benchmark trading day 0 is the execution day).

(A), cumulative returns before the announcement date are near zero up to day -20 , and start increasing significantly and steadily thereafter, reaching a peak on the announcement day. Returns remain fairly stable in the post-announcement days. This suggests that some information leakage about the decision to split the stock occurred, while insider trading cannot be ruled out as an explanation for the pre-split run-up. Interestingly, all news about the split is absorbed by the announcement date.

Unlike evidence from developed stock markets, results in panel (B) suggest a sharp increase in share price following the execution day. However, almost the entire gains from the split execution gradually disappear in the subsequent 200 trading days. This graphic evidence is in line with an irrational investor reaction to the split execution and a delayed correction to this anomaly. In summary, comparing the pre- and post-split evidence shown in Fig. 2, we observe that 200 days after the ex-day, splitting firms lose some but not all of the collective gains they have earned from the split. These losses roughly offset the ex-day gains, reducing total split-related gains to their announcement day levels (the extreme ex-day returns forbid us from measuring post-announcement returns for an extended time period because splits are executed within a few weeks from their announcement).

To explore the possibility that the splitting firms contributed to the creation of the Cyprus Stock Exchange bubble, we estimated a separate index for stock-splitting firms over the sample period and compared that to the non-splitting firms' index. As shown in Fig. 3, the splitting firms were indeed associated with the creation of the CSE bubble. Since April 1999, when the first stock split occurred, up to the peak of the bubble in November of 1999, the splitting firms' index rose from 100 to around 1400 points, whereas the index of the non-splitting firms rose to around 800 points. Thus, results show that the splitting firms' index increased by almost twice as much compared to the non-splitting firms' index during the pre-peak period. Results also show that the splitting firms' index appears to decline at a much greater rate than the non-splitting firms' index in the post-peak period.



Fig. 3. Stock performance of separate indices of splitting and non-splitting firms around the stock bubble period. This figure shows the stock performance of separate indices of splitting and non-splitting firms around the stock bubble period 1999–2001.

To further explore the possibility that the splitting firms led the non-splitting firms into the bubble, we attempted to explain the daily returns of the index of non-splitting firms using the lagged daily returns of the splitting firms' index for the period between April 1999 and December 2001. Various models were estimated using anywhere from 1- to 10-day lags to this end. The results, presented in Table 1, suggest that there is a strong, statistically significant relation between the daily returns of the non-splitting firms' index and the returns of the splitting firms' index on the prior day. These results suggest that the stock performance of non-splitting firms during that period was partly guided by the stock performance of the splitting firms. As a further check, to control for autocorrelation in returns, as that is evidenced by the rise and fall of the overall market index, in our regressions, we also controlled for the lagged returns of the non-splitting firms. That variable was also positive and significant, confirming that returns exhibit significant autocorrelation. Importantly, the splitting firms' index continued to be positive and significant, suggesting that splitting firms led, on average, non-splitting firms, even after controlling for autocorrelation. Thus, we conclude that splitting firms exhibited a much greater boom and bust during the bubble (see Fig. 3), and more tentatively argue that they led non-splitting firms by one trading day in doing so. This evidence notwithstanding, we

Table 1

The association between the returns of non-splitting firms with lagged splitting firm returns from April 1999 to December 2001

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.001 (0.703)	0.001 (0.628)	0.0001 (0.527)	-0.110*** (-7.065)	-0.081*** (-7.749)	-0.050*** (-8.360)
R_{t-1}	0.292*** (8.876)	0.289*** (8.295)	0.269*** (7.617)			
R_{t-2}		-0.0874 (-0.510)	-0.022 (-0.601)			
R_{t-3}		0.0784*** (2.249)	0.051 (1.390)			
R_{t-4}			0.072* (1.955)			
R_{t-5}			0.057 (1.605)			
R_{t-1-t_1}				0.110*** (7.148)		
$R_{(-1, -5)}$					0.0813*** (7.885)	
$R_{(-1, -10)}$						0.050*** (8.650)
Sample size	653	653	653	653	653	653
F-statistic	78.792***	28.090***	18.877***	51.089***	62.166***	74.831***
R^2 adj.	0.106	0.111	0.120	0.071	0.086	0.102

The dependent variable is the daily return for the non-splitting firms' index. The independent variables are the returns of the splitting firms' index, both daily and cumulated for 3, 5, and 10 days prior to day t . t is the day the return is measured for the dependent variable. *, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively.

Table 2
Cumulative abnormal returns around stock split announcements and executions in the Cyprus stock exchange

Period	AVG (CMAR _(t-1, t+1))	t-Test	Z-value	N
<i>Panel (A) Announcement of split</i>				
CMAR _(-1, 0)	0.0445	2.60**	2.57***	45
CMAR _(-2, +2)	0.0647	2.62**	2.52**	45
CMAR _(-5, +5)	0.0961	3.64***	3.17***	45
CMAR _(-10, +10)	0.1514	3.14***	3.12***	45
<i>Panel (B) Split ex-day</i>				
CMAR _(-1, 0)	0.0097	0.36	0.44	43
CMAR _(-2, +2)	0.1005	2.99***	2.64***	43
CMAR _(-5, +5)	0.0915	1.94*	1.66*	43
CMAR _(-10, +10)	0.2009	3.00***	2.83***	43

***, **, *Statistically significant at the 0.01, 0.05, 0.10 levels, respectively.

Average cumulative market-adjusted returns (CMAR) for the 45 splitting firms. The analysis refers both to the announcement (panel A) and execution day (panel B) of the stock splits. The third and the fourth columns show a parametric *t*-test and a non-parametric Wilcoxon test across firms, respectively. The last column shows the number of events that are used in each case.

cannot definitively preclude the possibility that splitting firms were just an example of the overall market boom and bust phenomenon.

Next, Table 2 presents statistical evidence on the market reaction to split announcements (panel A) and split execution (panel B) for various event windows.⁸ Tests on market-adjusted returns are presented. In line with the graphic evidence and with Hypothesis 1, windows of 2, 5, 11, and 21 days consistently capture a significantly positive announcement period effect of varying magnitudes. The largest market-adjusted return is observed for the period $(-10, +10)$ to be 15.14%; $t=3.14$; Wilcoxon $z=3.12$; both $p<0.01$. Similarly, with the exception of the 2-day window, tests on the market reaction around the execution day reveal highly positive returns. Again, these returns are the highest for the 21-day window at 20.09%; $t=3.00$; Wilcoxon $z=2.83$; both $p<0.01$.

In Table 3, we address the time that elapses between split announcement and split execution, breaking that gap down to 15-day intervals. The market reaction per sub-sample on the announcement and execution periods (5- and 21-day windows) is also provided. On average, splits are executed 67 days after they are publicly announced. In general, there is no discernible relation between the announcement-to-execution time interval and the market reaction to splits, neither for the announcement nor for the execution periods.⁹

To address whether there is learning in the market reaction to splits through time, in Table 4, we partitioned the sample into five 4-month intervals. We then examined the market reaction per sub-sample on the announcement and execution periods (5- and 21-day windows). The descriptive results do not reveal any notable trend in the market's assessment of stock splits through time, although the second and third 4-month periods,

⁸ Two firms announced but did not carry out their stock splits. Forty-three firms are included in these tests.

⁹ We further estimated this relation in two cross-sectional regressions of split-induced announcement and execution returns on a continuous announcement-to-execution time variable. The (non) results hold.

Table 3

Split announcement and execution returns for sub-samples of firms partitioned by the number of days from split announcement to split execution

Time gap	<i>N</i>	$CMAR_{t-2, -2, ANN}$	$CMAR_{t-2, -2, EX}$	$CMAR_{t-10, -10, ANN}$	$CMAR_{t-10, -10, EX}$
1–15	0				
16–30	4	0.0544	0.0651	0.2119	0.1710
31–45	5	–0.0604	0.1252	0.0668	–0.0938
46–60	8	0.0558	0.0315	0.2533	0.1065
61–75	6	0.1862	0.3028	0.0461	0.8675
76–90	5	0.1763	0.0092	0.2936	0.0581
91–105	9	0.0427	0.1925	0.1422	0.2130
106–120	0				
121–135	3	0.0812	0.0810	0.3945	–0.0101
136–150	0				
151–175	2	0.2473	–0.0151	0.4880	0.1603
Total	42				

This table presents cumulative market-adjusted returns (CMAR) for both announcement and execution dates for each time gap. Time gap is the number of days that elapsed between the announcement and the execution date. *N* stands for the number of firms in each time gap. ANN stands for the announcement date, EX stands for the execution date. $CMAR_{t-2, -2, ANN}$: Cumulative market-adjusted returns for the period 2 days before until 2 days after the announcement date.

representing the market's peak, generally exhibit higher split-induced returns. Indeed, by the end of the period, such returns become more modest. In sum, it appears that the strength of the market reaction to splits follows in import the price behavior of the market. A learning effect is not discernible.

Table 5 presents tests of the significance of market-adjusted returns for longer intervals around the event days. First, the 50-day period leading up to the announcement (–60, –11) is positive and significant, in line with the pre-announcement run-up that was described by panel (A) of Fig. 2. Beginning 60 days after the split execution, returns are negative, in line with a reversal in the positive split-induced returns. Near-zero returns are observed for the first 50-day window. Negative returns are observed for the second, third, and fourth 50-day window after day +10 (–3.24%, –5.64%, and –8.91% respectively).

Table 4

Split announcement and execution returns for sub-samples of firms partitioned by the time of the split announcement

Period	<i>N</i>	$CMAR_{t-2, -2, ANN}$	$CMAR_{t-2, -2, EX}$	$CMAR_{t-10, -10, ANN}$	$CMAR_{t-10, -10, EX}$
May 99–Aug 99	8	0.0257	0.0926	0.0808	0.0470
Sep 99–Dec 99	11	0.0947	0.2357	0.1966	0.5520
Jan 00–Apr 00	12	0.1683	0.0109	0.4276	0.0399
May 00–Aug 00	5	0.0321	0.1377	–0.1522	0.2220
Sep 00–Dec 00	7	–0.0344	0.0512	0.1138	0.1222
Total	43				

This table presents cumulative market-adjusted returns (CMAR) for both split announcement and execution dates for each sub-period that the stock split took place. Total of five sub-periods. *N* stands for the number of firms in each sub-period. ANN stands for the announcement date, EX stands for the execution date. $CMAR_{t-2, -2, ANN}$: Cumulative market-adjusted returns for the period 2 days before until 2 days after the announcement date.

Table 5
Long-window market-adjusted returns (LWMAR) around split announcements and executions

Period of cumulation	Benchmark trad. day 0	Average LWMAR	<i>t</i> -Test	<i>z</i> -Value	<i>N</i>
(-60, -11)	Announcement	0.1329	2.25**	2.15**	39
(+11, +60)	Ex-day	0.0054	0.081	0.991	41
(+61, +110)	Ex-day	-0.0324	-0.7	-1.457	38
(+111, +160)	Ex-day	-0.0564	-1.623	-1.313	37
(+161, +210)	Ex-day	-0.0891	-2.37**	-1.98**	35
(+11, +110)	Ex-day	-0.0462	-0.611	-1.211	38
(+11, +160)	Ex-day	-0.1022	-1.331	-1.76*	37
(+11, +210)	Ex-day	-0.1925	-1.93*	-2.18**	35
(+61, +210)	Ex-day	-0.1813	-2.91***	-2.85***	35

***, **, *Statistically significant at the 0.01, 0.05, 0.10 levels, respectively.

Long window market-adjusted returns (third column) for different event windows. For the period referring to the trading days, -60 to -11 day zero is the announcement day and for the rest of the periods, day 0 is the ex-day. A parametric *t*-test and a non-parametric Wilcoxon test are constructed to show whether stock returns are statistically different from zero during these periods. The last column shows the number of firms that are used in each case.

At a total of -18.13%, these market-adjusted returns are the lowest for the (-61, +210) window, and are statistically significant at $p < 0.01$. These results are consistent with Hypothesis 2, and the notion that splitting firms severely underperform the market in the year following the split execution.

Panel (A) of Table 6 presents descriptive statistics for the variables measuring the return windows around the split announcement and execution, as well as variables approximating potential explanations for these returns. Panel (B) of Table 6 presents pair-wise Pearson correlations among these variables. From panel (A), the average splitting firm traded at 4.54 Cyprus pounds at the time of the split and had a trading volume ratio of 3.71%. The average split factor was 3.24. Consistent with earlier results, significant positive returns (15%) are observed before the split announcement, at the split announcement (17%), and at the split execution (21%), while negative returns (-20%) are observed in the post-split period. The correlation matrix in panel (B) suggests that the variables are generally uncorrelated with two exceptions: first, there is weak evidence that the announcement period return reinforces the pre-split return pattern ($r = 0.28$; $p < 0.09$), and, most importantly, that the execution day return is largely reversed in the 200 post-split trading days ($r = 0.60$; $p < 0.01$).

In Table 7, we attempt to explain the market reaction to split announcements (panel A), split executions (panel B), and the post-execution returns anomaly (panel C) using OLS regressions. In all regressions, the variables are winsorized to the 5th and 95th percentile to reduce the effect of extreme observations. Our interpretation of the results was similar in spirit when we used ordinal rather than raw variable values.

We approximate the liquidity explanation for stock splits using the pre-split trading volume and share price variables. We expect that splits will be most beneficial in enhancing liquidity, and should thus elicit a more favorable market response, when pre-split share prices are high (presumably outside an optimal range), and trading volumes are low. Second, we approximate an information explanation by the split factor and the pre-split increase in share price. Following McNichols and Dravid (1990), we expect that

Table 6
Descriptive statistics and Pearson correlations among the liquidity and information variables and split-related returns

	CMAR _t 10, +10ann	PRICE _t 11	CMAR _t 60, 11	Volume ratio	Split factor	CMAR _t 10, +10ex	CMAR _t 11, +210
<i>Panel (A) Descriptive statistics</i>							
Mean	0.17	4.54	0.15	3.71	3.26	0.21	-0.20
Median	0.19	3.32	0.12	2.05	2.50	0.11	-0.18
Std. Deviation	0.31	4.24	0.33	3.55	2.21	0.40	0.55
Minimum	0.42	0.58	-0.50	0.51	1.25	-0.44	-1.19
Maximum	1.10	23.40	0.77	11.77	10.00	1.18	0.87
Percentiles	25 75	1.91 5.55	0.09 0.37	1.29 5.29	1.88 4.13	-0.04 0.46	0.61 0.11
N	45	45	39	27	45	43	35
<i>Panel (B) Pearson correlations</i>							
CMAR _t 10, +10ann	1	0.06 0.69	0.28 0.09	-0.21 0.29	0.20 0.18	-0.13 0.43	0.19 0.28
PRICE _t 11		1.00	0.22 0.19	0.15 0.45	0.29 0.05	-0.19 0.22	0.22 0.21
CMAR _t 60, 11			1.00	0.22 0.27	0.22 0.17	-0.10 0.58	0.12 0.54
Volume ratio				1.00	-0.01 0.96	-0.02 0.92	-0.19 0.40
Split factor					1.00	0.11	-0.02
CMAR _t 10, +10ex						1.00	0.93
CMAR _t 11, +210							0.60 0.00 1.00

Panel (A) presents descriptive statistics (mean, median, standard deviation, minimum, maximum, lower and upper quartiles) for all the variables used in the regression models. CMAR (x, y): cumulative market-adjusted returns from day x to day y . Price - 11: stock price - 11 days prior to the announcement date, volume ratio (%) is the trading volume in number of shares for firm i divided by the number of shares outstanding over the 50-day pre-announcement trading period (-110, -61), split factor is the number of common shares outstanding after the stock split divided by the number of common shares outstanding before the split.

Panel (B) presents Pearson correlation statistics for all the variables used in the regression models. P -values are presented in italics on the second line. CMAR (x, y): cumulative market-adjusted returns from day x to day y ; "ann" and "ex" stand for announcement and execution days, respectively; Price - 11: stock price - 11 days prior to the announcement date, volume ratio is the trading volume in number of shares for firm i divided by the number of shares outstanding over the 50-day pre-announcement trading period (-110, -61), split factor is the number of common shares outstanding after the stock split divided by the number of common shares outstanding before the split.

Table 7

Regression results of the association of liquidity and information variables with cumulative market-adjusted returns (CMAR)

Panel (A) Dependent variable: $CMAR_{(-1, -10)}$ announcement

Raw variables

	α	β	Adj- R^2	F-statistic	N
Price ₋₁₁	0.1901 (2.743***)	-0.0047 (-0.404)	0.00	0.16	44
CMAR _(-60, -11)	0.1407 (2.752***)	0.2505 (1.761*)	0.08	3.10	38
Volume ratio _(-110, -60)	0.2820 (3.136***)	-0.0192 (-1.086)	0.05	1.18	26
Split factor	0.0760 (0.913)	0.0284 (1.351)	0.04	1.83	44

Panel (B) Dependent variable: $CMAR_{(-10, +10)}$ ex day

Price ₋₁₁	0.2885 (3.268***)	-0.0176 (-1.252)	0.04	1.57	44
CMAR _(-60, -11)	0.2484 (3.131***)	-0.1239 (-0.562)	0.01	0.32	38
Volume ratio _(-110, -60)	0.2383 (1.721*)	-0.0026 (-0.097)	0.00	0.01	26
Split factor	0.1432 (1.295)	0.0191 (0.695)	0.01	0.48	44
CMAR _(-10, -10) ANN	0.2420 (3.266***)	-0.1650 (-0.798)	0.02	0.64	41

Panel (C) Dependent variable: $CMAR_{(-11, +210)}$

CMAR _(-10, +10) ANN	-0.2292 (-2.202**)	0.3067 (1.089)	0.04	1.19	44
CMAR _(-10, +10) EX	-0.0266 (-0.310)	-0.8028 (-4.304***)	0.36	18.52	38
CMAR _(-60, -11)	-0.0953 (-0.818)	-0.1866 (-0.618)	0.01	0.38	26

**, *, *Statistically significant at the 0.01, 0.05, 0.10 levels, respectively.

Panel (A) shows the regressions where the dependent variable is the announcement window cumulative market-adjusted returns and the independent variables are (1) the price prior the announcement window, (2) the cumulative market-adjusted returns for the trading period -60 to -11 before the announcement, (3) the volume ratio (the trading volume in number of shares for firm i divided by the number of shares outstanding over the 50-day pre-announcement trading period (-110, -61), and (4) the split factor (the number of common shares outstanding after the stock split divided by the number of common shares outstanding before the split). Panel (B) shows the regressions where the dependent variable is the ex-day window cumulative market-adjusted returns and the independent variables are the same as in panel (A), plus the 21-day announcement related market-adjusted return. Panel (C) shows the regressions where the dependent variable is the long window cumulative market-adjusted return from -11 to +210 after the execution, and the independent variables are the cumulative market-adjusted returns for both the announcement and the ex-day windows and the pre-announcement return from -60 to -11 (t -statistics are in parentheses). Independent variables are winsorized to the 5th and 95th percentile

greater split factors send a more favorable signal to market participants, and should thus be associated with more positive announcement period returns.¹⁰ Last, the pre-split run-up is a measure of adverse selection and should reinforce announcement-induced returns. That is, a stock split is a costly-to-replicate signal. Therefore, only managers believing that the run-up truly reflects fundamental value would announce a split.

In panel (A), we examine these expectations through a series of simple regressions. The limited sample size does not allow us to use multiple regressions. In sum, we find no evidence that split announcements in Cyprus are related to liquidity considerations. We find, however, limited evidence that information considerations may contribute to the

¹⁰ In this setting, the split factor may alternatively help to address the conjecture that irrational investors erroneously believe the split reflects a multiplication in firm value. Alternatively, using a log transformation for the split factor does not, in any way, change our interpretation of the results.

positive market reaction. Specifically, the pre-event run-up is weakly positive and significant ($t=1.76$; $p<0.08$). Additional tests in panel (B) fail to identify any relation between information and liquidity considerations to the positive market reaction to split execution. This result leaves unsolved the puzzle of the ex-day returns.

Results in panel (C) of Table 7 provide some revealing evidence. Specifically, the negative post-split performance that was documented in Fig. 2 and Table 5 can be explained well by the market reaction to the split execution (but not the split announcement): i.e., the greater the market reaction to the split execution, the greater the post-split drop in share price ($t=4.30$ and adjusted $R^2=36.0\%$). It seems that the irrational and unexplained increase in share price that is associated with splitting a stock is corrected in the post-split months. That correction is proportionate to the initial market reaction to the split execution.

Put in a broader context, our results present an empirical puzzle. Although some variation exists in the market reaction to stock splits across markets, the erratic return behaviour exhibited in the Cyprus market appears unprecedented. Unlike our evidence, in larger and more developed markets such as the United States (e.g., Lamoureux & Poon, 1987), Germany (Wulff, 1999), Hong Kong (Wu & Chan, 2000), and Denmark (Bechmann & Raabale, 2004), the market reaction to splits is positive but quite modest, and is often attributed to liquidity or signaling factors: in Switzerland it was recorded to be near zero (Kunz & Majhensek, 2004). Thus, in developed markets, the empirical evidence does not provide support for an irrationality view of the market reaction to splits.

Evidence on stock splits coming from emerging markets has been sparser. Batchelor and Orakcioglu (2004) report a zero price effect and an increase in volatility accompanying the execution of bonus issues in Turkey, while Barnes and Ma (2002) find a positive market response to the proposal and approval of bonus issues in the Chinese stock exchanges. Nevertheless, prior evidence from these emerging markets does not resemble the extreme price effects that were observed in the Cyprus Stock Exchange during the bubble period. Further study of alternative emerging markets might prove enlightening for this purpose.

6. Conclusion

We find substantial gains to shareholders around the announcement and execution of splits. These gains do not seem to be explained by liquidity or signaling variables. They are, however, partly reversed in the post-split months, and this reversal is significantly related to the initial market reaction on the split execution date. We interpret this as evidence that Cypriot investors acted irrationally, misunderstanding the mechanics of stock splits.

Our results cannot be explained by insufficient controls for risk, given that splitting firms are likely to be much less risky than non-splitting firms: on average, they are much larger as measured by equity capitalization, and have lower betas. Further, the inclusion of splitting firms in the market index tones down the true effect of splits because these returns are partly offset by the expectations benchmark; raw returns are in excess of 30% around both the announcement and the execution date. One potential implication of our results is that splitting firms have contributed to the creation of the stock market bubble. Yet,

notwithstanding our empirical evidence, we cannot definitively preclude the possibility that splitting firms were just an example of the overall market boom and bust phenomenon.

This apparent elementary error that has been associated with the discovery of the CSE by Cypriot investors suggests the following: while much is made of disclosure of information in emerging markets, little attention has been paid to the ability of investors to process such information correctly. We believe that investor education should be a vital component for the development of emerging markets. In general, policy makers seem to advocate that more rules and regulations will protect investors by forcing other market participants to “do the right thing.” The evidence from this study casts doubt on this contention. While a comprehensive institutional framework should rely on the philosophy of improved disclosure that triggers market forces, for such disclosure to have the desired effect, emphasis should be placed on making investors more knowledgeable, and therefore wiser.

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The association between ISO 9000 certification and financial performance[☆]

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Abstract

This study explores the association between ISO 9000 certification and financial performance at the organizational level in a mature quality initiative market. It extends the limited literature on quality initiatives and objective measures of financial performance. The study hypothesizes that ISO 9000 certification is associated with improvements across three dimensions of financial performance. These dimensions are operating efficiency, growth in sales, and overall financial performance. These dimensions of performance are measured using profit margin, growth in sales, and earnings per share, respectively. Based on data for a sample of 70 companies listed on the Singapore Stock Exchange over a 6-year period, the results of the study are consistent with the hypothesized effects. In particular, the results show that the extent of improvement is driven largely by operating efficiencies and suggests that firms can benefit from ISO 9000 certification if they are genuinely interested in the quality philosophy by improving their internal business processes.

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Data availability: all data used in this study are available from public sources.

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1. Introduction

Quality management initiatives such as total quality management (TQM) and just-in-time systems (JIT) are receiving growing attention in management accounting textbooks. However, the effect of such initiatives on financial performance has received little attention in academic research. This is probably because much of the research on quality and self-reported non-financial firm performance measures are located in the quality management paradigm. Noting the lack of studies on quality initiatives generally, Maher (1995) urged accounting researchers to undertake a time-series exploration of the effects of quality initiatives on organizational performance. However, such research remains scarce in the accounting discipline. Ittner and Larcker (1995) were among the first management accounting researchers to study the effect of quality management practices on organizational performance. Balakrishnan, Linsmeir, and Venkatachalam (1996) and Kinney and Wempe (2002) investigated the financial impact of JIT systems. Most recently, Nagar and Rajan (2001) studied the relationship between financial and non-financial indicators of quality and future sales.

However, it is not easy to establish an empirical relationship between the adoption of quality initiatives such as TQM and JIT and firm performance that are measured by accounting variables. The difficulty of establishing an empirical relationship between TQM and JIT initiatives on firm performance stems from determining the objectivity of the extent of adoption, the validity of the adoption claims by the firm, and identifying an adoption date. Easton and Jarrell (1998, p. 256) describe the problem in the context of TQM as follows:

First, whether or not a firm has seriously pursued TQM cannot be determined by relying on the firm's public announcements. Many firms claim to be implementing TQM when, in fact, they have made essentially no changes (other than in their public rhetoric). . . . Second, firms seldom publicly announce the beginning of the deployment of their TQM systems. In fact, there is often no completely unambiguous start date.

The purpose of this research is to investigate the association between International Organization for Standardization 9000 (ISO 9000) certification and financial performance at the organizational level. A study of the effect of ISO 9000 certification on financial performance alleviates the limitations of prior studies because the certification process requires compliance with the elements of the ISO 9000 standards. The certification process is conducted by an approved independent ISO 9000 registrar. If a firm meets the ISO 9000 standards following an audit by a registrar, the firm is issued an ISO 9000 certificate that includes the scope of certification and the effective date. While certificates are typically issued for 3-year periods, compliance review is performed every 6 months.

Although ISO 9000 certification has been globally pursued and implemented, very few studies have explored its impact on objective measures of financial performance. The literature abounds with studies examining the effect of ISO 9000 certification on self-rated performance measures such as product quality, defects, employee satisfaction, employee turnover, customer satisfaction, supplier quality, and productivity, to name a few. While such studies add to our knowledge about the effects of ISO 9000 certification and quality

systems on performance, the use of self-rated performance measures is not independent, suffers from self-reporting bias, and, thus, presents limitations. The implications of self-rated measures are well recognized in the management accounting literature.

Moreover, the phenomenal growth in the number of companies attaining ISO 9000 certification worldwide suggests certification will yield benefits to the firm.¹ The benefits appear to have been realized because, as noted previously, the literature is replete with self-rated benefits of ISO 9000 certification. However, whether ISO 9000 certification is associated with more objective measures of performance remains an empirical issue. If ISO 9000 certification is not positively associated with financial performance, it may possibly lose credibility and be regarded as another management fad. It is conceivable that the self-rated benefits are a self-fulfilling prophecy. Juran (1999), one of the pioneers of quality concepts, is quite pessimistic about ISO 9000 and has called for research demonstrating the financial benefits of the costly ISO 9000 certification process. This study fills the current void in the literature and addresses an important policy and strategic issue.

Specifically, I investigate the extent to which ISO 9000 certification improves financial performance at the organizational level and make the following contributions. First, I use financial performance measures derived from audited financial statements. Prior literature investigating ISO 9000 effects has focused on self-rated measures of performance that suffer from inherent bias. Second, prior studies have largely investigated differences in performance between firms with ISO certification and those without in the post-ISO period. I extend this literature by providing evidence on ISO 9000 certification and the *extent* of improvement in financial performance. I investigate the financial performance of firms based on data 3 years prior to and 3 years after ISO 9000 certification. I also employ a benchmark of matched-control firms that never pursued ISO 9000 certification either in the period of study or 3 years thereafter. This is the most important contribution of the study as it provides an objective assessment of the impact of ISO 9000 certification on performance.

Third, I study a range of industries. I do not restrict my sample to manufacturing firms for the simple reason that ISO 9000 certification is a non-industry specific standard. The ISO Survey of ISO 9000 lists 39 industries from which companies have attained certification, yet studies confine their analysis to the manufacturing industry.² However, I test the sensitivity of my results to industry membership and find that the results relating to the effects of ISO 9000 certification on performance is not affected by industry membership.

Fourth, I study the certification effect on performance in an emerging market (Singapore) where the quest for gaining global competitive advantage both within the region and against firms from developed nations such as Japan, the United Kingdom and the United States is intense. An emerging market is also studied because there is very little evidence on quality initiatives outside the major markets such as Japan, the United Kingdom and the United States (Low, Tan, & Ang, 1999). As multinational corporations

¹ Since 1983, the number of ISO 9000 certificates issued has grown from just under 28,000 to over 400,000, spanning 158 countries in December 2000. As of December 2000, Europe comprised 53.87% of total certifications with Asia in second place with 20.05%.

² For details refer to "The ISO Survey of ISO 9000 and ISO 14000 Certificates—Tenth Cycle" published by the International Organization for Standardization.

shift their manufacturing processes to developing nations, such as those in Asia, studying emerging markets becomes even more critical. In concert, suppliers in emerging markets are facing increasing pressure from their global customers in the major markets to provide the highest quality goods and services (Chan, 2000; Quazi, Chang, & Chan, 2002). ISO 9000 certification is a global recognition of achieving high and consistent quality standards.

Finally, Singapore, as a mature ISO certified nation, provides a suitable context for investigating whether ISO certification is associated with higher financial performance.³ In non-mature ISO contexts, the “first mover” to attain certification might experience gains due to visibility rather than to improvements in its internal business processes. In a mature ISO context, where most firms are ISO certified and competition is intense, superior performance would demand genuine improvements to internal processes visible to customers through higher quality products and value-for-money prices.

The analysis, based on 384 firm-years of data derived from 70 companies listed on the Singapore Stock Exchange over a 6-year period revealed that the financial performance of firms achieving certification was significantly greater than non-certified firms. More importantly, the results indicated that ISO 9000 certification was associated with significant improvements in financial performance; the control-firm adjusted performance in the post-ISO 9000 certification period was significantly greater than that in the pre-ISO 9000 certification period. The results are robust to sensitivity and selection-bias tests. These results imply that ISO 9000 certification possesses economic significance and firms can enhance performance through certification.

However, the analysis shows that the increase in performance is attributable largely to improvements in operating efficiency and, to a lesser extent, growth in revenue. Gains in performance arise, therefore, if firms are genuine in their ISO 9000 implementation process. The results and more critically the design of the study assist in explaining inconsistencies in the literature. As with studies of this nature, the results and inferences drawn ought to be considered in context and with regard to the limitations of the study as discussed in the concluding section of the paper. The next section provides the background on ISO 9000 certification and discusses the relevant literature. The research hypotheses are articulated next followed by the research method. The final two sections present the results and conclude the study.

2. Background and literature review

2.1. ISO 9000 certification

The strategic management agenda of firms increasingly emphasize quality management systems. Since the promotion of quality concepts by Crosby, Deming, Ishikawa, and Juran,

³ The rate of ISO certification in Singapore has stabilized at approximately 4,000 companies with most registrants being small and medium enterprises that are not publicly listed. The number of listed companies in Singapore was approximately 500 as at November 2001 and many of them are now certified to ISO 9000.

firms around the globe have gradually embraced quality management practices. One of the milestones in quality management was the establishment of international standards for quality. In 1987, the International Organization for Standardization (ISO) issued standards to establish and foster voluntary adoption of global industrial and manufacturing standards. ISO 9000 is “a series of international standards dealing with quality systems that can be used for external quality assurances purposes” (ISO, 1987). Unlike quality standards relating to products and services, the ISO 9000 standards apply to the quality management system. The purpose of the ISO 9000 standards is to ensure that a certified company maintains a quality management system that will enable it to meet its published quality standards relating to the processes and activities for delivering goods and services. The Standards provide guidelines for the development, implementation, and management of a quality management system. Organizations must document practices that affect the quality of their products and deliver the procedures consistently to gain and maintain ISO 9000 certification.

In short, ISO 9000 could be viewed as a system for managing internal business processes from the beginning to the end of a value chain. Certification can only be confirmed after an independent ISO audit. Regular independent audits are performed to maintain certification. An unsatisfactory audit will lead to de-registration with subsequent registration contingent upon meeting the requirements of certification. Therefore, obtaining and maintaining ISO 9000 certification is a continuous and costly process.

Despite the apparent expense and bother, ISO certification has increased exponentially in Singapore. Since 1989 at least 3900 organizations have attained certification for ISO 9000. As part of its economic development strategy, the Singapore government continues to encourage local industries to achieve certification by providing ISO implementation subsidies (Quazi et al., 2002). In Asia, Singapore is second only to South Korea in quality initiatives. According to Chan (2000), Singapore has almost reached the highest echelon of quality management practices by implementing world-class benchmarking systems in the quest for attaining Global Quality Management status. While these initiatives are encouraging, the research evidence to date has yet to show that such practices have led to significant improvements in financial performance not only in Singapore but elsewhere. The next section reviews this evidence.

2.2. Literature review

The following review of the prior literature is categorized into studies investigating the effects of ISO 9000 certification on non-financial performance measures and those investigating the impact on financial performance.

2.2.1. Non-financial performance studies

There is an extensive literature on the effects of ISO 9000 certification on non-financial performance measures. The review presented here is not exhaustive but representative for illustrative purposes. Evidence in the literature is mixed. Contextual differences and management's motivation for seeking certification explain the inconsistent results observed.

Rao, Ragu-Nathan, and Solis (1997) surveyed companies in China, India, Mexico and the United States to determine the effects of ISO 9000 certification on quality management

practices and self-rated measures of non-financial performance. Most (77%) of their respondents were manufacturers. They concluded that ISO 9000 certification had a significant impact on quality management practices such as leadership, strategic quality planning, good supplier relationships and customer satisfaction. They also reported that ISO certification was significantly related to rework, throughput time, productivity, and market share.

Elmuti and Kathawala's (1997) study of two manufacturing plants in a large U.S. organization showed that the plant with ISO 9000 certification had better and improved quality of work life compared to the non-certified plant. They also found that ISO 9000 certification increased employee productivity, morale, and goal congruence while it decreased absenteeism, rework, and defects. Export sales of the plant were also enhanced. Chittenden, Poutziouris, and Muhktar (1998) found that U.K. firms attaining ISO 9000 certification reported benefits similar to those reported by Elmuti and Kathawala (1997). Consistent effects have been observed in Northern Ireland (McAdam & McKeown, 1999), Norway (Sun, 1999) and North America (Simmons & White, 1999).

However, results to the contrary have been reported by Beattie and Sohal (1999), Hua, Chin, Sun, and Xu (2000), Quazi et al. (2002), Shams-ur (2001), Yamada (2001). Beattie and Sohal's (1999) survey of 50 Australian companies showed that 25% of the companies could not identify any strategic benefits and a mere 4% reported improving their profitability following certification. Similarly, Shams-ur (2001) noted insignificant differences in self-rated organizational performance between small- and medium-sized enterprises (SMEs) with and without ISO 9000 certification in Australia. Hua et al.'s (2000) survey of 100 companies in Shanghai found no significant differences in quality-related performance measures between companies with ISO 9000 certification and those without. Yamada's (2001) survey of certified Japanese companies could not identify the effects of ISO 9000 certification on estimated expenses and profits of large companies listed on the Tokyo Stock Exchange. More recently, Quazi et al.'s (2002) replication of Rao et al. (1997) revealed that ISO 9000 certification did not affect quality management practices and quality related measures of companies in Singapore. The lack of expected relationships was attributed to the nature of the sample as 62% of the respondents were SMEs. In contrast, the respondents in Rao et al. (1997) were mainly large organizations. A further explanation for the difference is that SMEs are usually "pushed" into certification by their customers and consequently, the real drive towards quality improvement is lacking (Wiele & Brown, 1997–98).

Low et al. (1999) explain that the motive for attaining certification explains the lack of observed positive association between ISO 9000 and firm performance. They investigated whether ISO 9000 certification increased Singaporean contractors' CONQUAS score. The CONQUAS score is a system for assessing a contractor's quality of work. The assessments were made on site by assessors from the Construction Industry Development Board. They found that most companies experienced either a fall or an immaterial increase in their CONQUAS scores. Since the Singapore government gave rebates to ISO 9000 certified contractors for public tenders, the primary motive for certification was to secure government projects and rebates in the short term rather than committing to improve quality in the real sense. The decline in the CONQUAS scores following ISO 9000 certification is consistent with this view.

2.3. *Financial performance studies*

To date four studies have investigated the effect of ISO 9000 certification on non-self-rated financial performance measures derived from financial statements. Simmons and White (1999) studied 126 U.S. companies in the electronics industry and investigated whether three financial performance measures (ROA for profitability, sales/equity for operational performance, and foreign sales) were significantly different between the 63 ISO certified and the 63 non-ISO certified companies. The non-ISO companies were matched for industry and were not ISO certified in 1995. The performance measures were derived from the 1995 financial information available from COMPUSTAT. They found that ISO certified companies were more profitable than non-ISO certified companies but not with respect to operational performance and level of foreign sales. Simmons and White (1999) reported that most of the financial gains were attached to larger firms. However, they did not control for the potential presence of non-ISO firms seeking certification; that is, firms in the process of attaining certification. The study of just one year data also does not permit assessing the longer term effects of ISO 9000 certification nor does it allow them to isolate the effects of performance prior to ISO 9000 certification on post-ISO certification performance.

Häversjö (2000) argued that quality systems such as ISO 9000 certification would improve internal and external quality and consequently improve profitability. He investigated differences in the rate of return of ISO 9000 certified and non-ISO certified Danish companies.⁴ His results based on 664 companies showed significantly higher rate of return for ISO 9000 certified companies than their size-matched counterparts. The difference in performance between ISO companies and non-ISO companies was 20% in the year prior to certification and approximately 35% 2 years after certification. However, similar to Simmons and White (1999), his tests did not isolate the effects of pre-ISO performance on post-ISO performance; that is, to what extent was the performance in the post-ISO period due to a continuation of performance prior to attaining certification? An examination of his tabulated trend analysis shows that the difference in the 5 year average rate of return between the ISO and control firms was 29.8% prior to ISO 9000 certification and 12% following certification. It therefore appears from Häversjö's (2000) data that ISO 9000 certification is not associated with significant financial gains in the longer term.

More recently, Heras, Casadesus, and Dick (2002) provided evidence of certified Spanish firms outperforming non-certified firms. Using return on assets (ROA), their univariate tests show that the ISO 9000 certified firms achieved 24% to 45% higher ROA than non-certified firms over a 4-year period. However, like the preceding studies, Heras et al. (2002) did not control for factors (e.g., size, industry, prior performance) likely to influence performance and do not conduct selection-bias tests. They also do not test performance before and after ISO 9000 certification. In a subsequent study, Heras, Dick, and Casadesus (2002) control pre-certification performance in their univariate test and report that ISO certification does not increase profitability. With the exception of this

⁴ Häversjö (2000) does not define rate of return.

control, their study suffers from the preceding limitations that raise questions about the validity of their findings.

The four studies reviewed above appear to show some short-term differences in profitability following ISO 9000 certification. However, the studies are unable to demonstrate that the effects of ISO 9000 certification on financial performance were not a result of continuation of the pre-ISO 9000 certification performance. That is, they did not control for pre-ISO 9000 performance when determining post-ISO 9000 performance. None of the studies performed a selection bias test to determine whether the firms' underlying characteristics prompted them to seek ISO 9000 certification. If there are differences in profitability, then it is possible that the effects reported in prior studies have been overstated. The survey studies on self-reported financial and non-financial measures have similarly not been able to ascertain that post-ISO 9000 performance had improved following certification. In this study, I adopt a research design that allows me to test the extent of improvement in financial performance following ISO 9000 certification and control for extraneous effects. I also perform sensitivity and selection-bias tests that I discuss following the main results.

3. Hypotheses development

The literature identifies two fundamental theories that explain possible sources of gains following ISO 9000 certification. The two theories can be described as Internal Improvement Theory and External Improvement Theory. Both theories rationalize that performance in the post-ISO 9000 certification period should exceed performance in the pre-ISO 9000 certification period.

3.1. Internal improvement theory

The internal improvement theory is based on the rationale that ISO 9000 certification brings benefits through greater quality awareness among employees (e.g., Brooks, 1995; Brown & Van der Wiele, 1995; BSI, 2000; Dale, 1994; Peach, 1997), and increased productivity and efficiency (e.g., Arnold, 1994; Brooks, 1995; BSI, 2000; Buttle, 1997; RAB, 2000; Reed, Lemak, & Montgomery, 1996). In other words, ISO 9000 certification seems helpful for companies seeking to improve the quality of their internal business processes. ISO 9000 certification is frequently regarded as the stepping stone to achieving total quality in the entire organization (Quazi et al., 2002). The following sub-sections briefly articulate drivers of quality-related improvements in a firm's internal business processes.

3.1.1. Quality awareness

Quality-conscious employees understand the importance of producing high-quality output and are capable of executing the operations with that objective in mind. ISO 9000 facilitates this objective by providing "guidelines for developing a quality system and the process of acquiring certification impose a certain level of discipline on an organization" (Carr, Mak, & Needham, 1997, p. 387). Consequently, a company accredited with ISO

9000 is dedicated to maintaining a high-quality environment. Hence, workers would experience fewer problems on the job and consequently increase their motivation and job satisfaction that ultimately manifests in better financial performance.

3.1.2. *Productivity and efficiency*

Productivity and efficiency relate to the rate at which goods and services above minimum satisfactory levels can be delivered to customers. Throughput rate and similar measures of productivity and efficiency increase when employees are aware of quality objectives, and when they are motivated and share common strategic visions. Marquardt (1992) provides evidence consistent with this view. Given the improvements in productivity and efficiency following certification, it is inferred that ISO 9000 certification reaps cost savings by eliminating non-value-added activities, reducing scrap, rework, and warranty claims. In summary, the internal improvement theory suggests ISO 9000 certification would improve internal business processes such that production becomes lean and costs decline.

3.2. *External improvement theory*

Although internal quality improvements are imperative, companies cannot ignore the needs and responses from the market (Lisiecka, 1999). After all, the purpose of a company is to maintain and increase profits and its survival is contingent on its ability to satisfy customers and sustain competitive advantage (Carr et al., 1997). In other words, a company's improvement must not be observable only from *inside* the organization; its external business partners should also be able to recognize the change and its quality.

While the pursuit for ISO 9000 accreditation may reflect an organization's strategic intent to be quality-focused, research indicates that the driving force could essentially be customers' expectations and contractual requirements (e.g., Brown & Van der Wiele, 1995; Rayner & Porter, 1991). Companies "stamped" with the quality logo increase customer confidence and help speed up the supplier-selection process (Dale, 1994; Yamada, 2001). Consequently, ISO 9000 certified firms are likely to increase their customer base and market share and, therefore, sales. These coupled with internal-process improvements could lead to improvements in overall financial performance.

The preceding discussion and the literature review suggest that gains in financial performance are available through ISO 9000 certification. In the current competitive environment many firms are seeking ISO 9000 certification to improve their internal business processes for competitive advantage. Conceptually, the balanced-scorecard framework would suggest that improvements to internal processes could lead to enhanced financial performance. Given that certification to ISO 9000 is evidence of improvements to the quality management system driving a firm's internal processes, it follows that ISO 9000 certification is associated with increased financial performance.

The balanced-scorecard framework also suggests that customer satisfaction is associated with sales revenue. This is the drive that comes from the firm's external environment. Finally, the balanced-scorecard framework relates improvements to the internal business processes to greater customer satisfaction and consequently better financial performance. The theories underpinning ISO 9000 certification and the balanced-

scorecard framework suggest the motivation for ISO 9000 certification could be either internal or external or both. Therefore, I specify three hypotheses.

Hypothesis 1 relates ISO 9000 certification to internal efficiencies and Hypothesis 2 refers to external effects. Hypothesis 3 reflects the belief that the benefits of ISO 9000 certification exceed its cost such that overall financial performance increases as a result. I use return on sales (earnings before interest, tax, and extraordinary items divided by net sales) as the financial measure for efficiency. I use growth in sales to capture the effect of the external improvement theory. Finally, I use earnings per share (operating income after tax divided by number of ordinary shares issued) to capture the overall improvement in financial performance related to ISO 9000 certification. Hence, I formulate the following three hypotheses:

H1. The financial efficiency (profit margin) of firms improves with ISO 9000 certification and is greater than firms without ISO 9000 certification.

H2. The growth (sales growth) of firms improves with ISO 9000 certification and is greater than firms without ISO 9000 certification.

H3. The overall financial performance (earnings per share) of firms improves with ISO 9000 certification and is greater than firms without ISO 9000 certification.

4. Research design

4.1. The sample

All Singapore incorporated companies listed on the main and secondary boards (SGX and SESDAQ) were identified for ISO 9000 certification from information held by the Productivity and Standards Board. Companies that were ISO 9000 certified after 1998 were eliminated because the study requires at least 3 years of post-certification data. I required 3 years of post-certification data to capture the benefits following a sufficient “gestation” period. Prior studies have not allowed a sufficient time for the effects of ISO 9000 certification to be realized. The primary data set included financial data through fiscal years ending December 31, 2000. Thus, companies listed after 1994 could not be included. Furthermore, companies incorporated overseas were eliminated from the sample due to an inability to establish their ISO 9000 certification status. Industries without any ISO 9000 certified companies were also omitted. Because I matched the ISO 9000 certified companies with a non-certified company (discussed below), companies that were in the process of attaining certification were excluded from the non-ISO matched sample. I determined this by referring to company websites, print media, and phone calls. Finally, ISO 9000 certified companies in industries without any non-ISO 9000 certified companies were eliminated. Forty companies did not have the required information and were thus eliminated. These procedures yielded a sample size of 52. To increase the sample size, 18 companies with at least 2 years pre- and 2 years post-certification data were added. Thus, the final sample size was 70 comprising 35 ISO 9000 certified and 35 matched non-ISO certified companies. Table 1 summarizes the sample-selection process.

Table 1
Sample selection process

Reason for elimination from the sample	No. of firms
Total listed companies on SGX and SESDAQ as at 28 November 2001	493
Company was listed after 1994	(222)
Company was ISO 9000 certified after 1998	(6)
Company was partially ISO 9000 certified	(16)
Company was incorporated overseas	(56)
Industry without ISO 9000 certified companies (e.g., diversified industry, investment, finance)	(57)
Excess unmatched non-ISO 9000 certified companies	(39)
ISO 9000 certified companies without matched non-ISO 9000 certified companies	(5)
Full set of financial data not available (3 years prior to and 3 years following the year of ISO 9000 certification)	(40)
<i>Remaining in the sample</i>	52
Companies added with most complete set of financial data (minimum 2 years prior to and 2 years following the year of ISO 9000 certification)	18
Total sample size	70

The distribution of ISO 9000 certification over the 8-year period was quite even, with the exception of 1994 which recorded the highest number of certifications. This is mostly due to the Singapore government “demanding” certification for construction firms’ eligibility to undertake large government projects. There was one certification in 1991, two in 1992, three in 1993, 11 in 1994, four in 1995, five in 1996 and 1997, and four in 1998. The sample was represented by the following industries; services 28%, engineering and machinery 26%, construction 20%, electronic and electrical 14%, packaging 6%, food producers 3% and household goods 3%. I conducted sensitivity tests for industry and year effects and found the results relating to the effects of ISO 9000 certification on financial performance were robust. The relevant results are reported in the Results section of the paper.

4.2. Research design and test variables

4.2.1. Matched control sample

As the study is concerned with the effects of ISO 9000 certification on financial performance, I employ a sample of ISO certified firms and matched non-ISO certified firms. The matched control firm also assists control for economy-wide and industry factors. Consistent with Simmons and White (1999), matched firms were selected based on industry classification and asset size. Matching on size also controls for the capability of firms to embark on the ISO 9000 certification process. Larger firms with greater resources and access to capital markets are capable of and committed to investing in long-run quality processes. A paired *t*-test of differences in size (total assets in year 0) between ISO 9000 certified and non-ISO 9000 certified firms was not significant ($t = 0.756, p > 0.10$). This suggests that the firms were appropriately matched. While I did not match the firms on their performance over the 3 years prior to certification, the data in Panel A of Table 2 shows the performance of the ISO

9000 certified and non-ISO 9000 certified firms do not significantly differ in the 3-year period prior to the certification year. Recognizing that more profitable and growth firms have incentives and the financial capacity to attain certification, I conducted self-selection bias tests and found that the results relating to the effects of ISO 9000 on performance are robust. Results of this test are reported in the Results section of the paper.

4.2.2. Test design

In recognition that the pre-ISO 9000 certification and post-ISO 9000 certification performance could be due to economy-wide and industry factors, or a continuation of firm-specific performance prior to ISO 9000 certification, I employed an adjusted performance measure when evaluating the effects of ISO 9000 certification on performance. The control-adjusted performance measure is computed as illustrated in Fig. 1. First, I derived a pre-ISO adjusted value (X) by comparing the financial performance for each ISO 9000 certified firm with its matched non-ISO 9000 certified firm for the 3 years prior to the certification year. Similarly, I derived a post-ISO adjusted value (Y) by comparing the financial performance for each ISO 9000 certified firm with its matched non-ISO 9000 certified firm for the 3 years following the certification year.

Second, I evaluate the *difference* between the pre-ISO adjusted value (X) and the post-ISO adjusted value (Y) as shown in Fig. 1 to determine the extent of improvement due to ISO 9000 certification. The test design attempts to control for the effect of economy-wide and industry factors and pre-ISO 9000 certification performance on post-ISO 9000 certification performance. This design ensures, *ceteris paribus*, that the difference in financial performance between the pre- and post-ISO 9000 certification periods relates to ISO 9000.⁵

4.3. Test variables

I use financial ratios to measure company performance. The approach is to use pre- and post-certification accounting data to test for changes in company performance. The ratios are computed for every company up to 3 years prior and 3 years subsequent to the certification year. Since this study is investigating whether ISO 9000 certification is associated with economic gains, the financial ratios selected reflect whether the source of the effect is internal or external. The three ratios used in this study focus on efficiency

⁵ A more complete and rigorous design would include ISO registered firms not continuing registration. The inclusion of such firms for comparative purposes would assist in ascertaining whether ISO certification was optimal, particularly for firms without ISO. However, the results of this study show that firms without ISO certification are significantly outperformed by their ISO certified counterparts following certification. Nevertheless, I discussed deregistration by ISO firms with the CEO and Vice President of the largest ISO authority in Singapore. The discussions revealed that firms very rarely deregister or not continue registration. The most common reasons for deregistration included relocation outside Singapore, terminating activities or winding up. Deregistration for publicly listed companies was the most rare; in fact the CEO and Vice President could not recall the deregistration of any company over the last few years. They explained that given their visibility, public companies do not deregister because of potential economic consequences both from trading partners and internal efficiencies. In short, the benefits of ISO 9000 certification are seen as valuable in Singapore and the lack of deregistration data does not allow me to study firms discontinuing ISO 9000 registration.

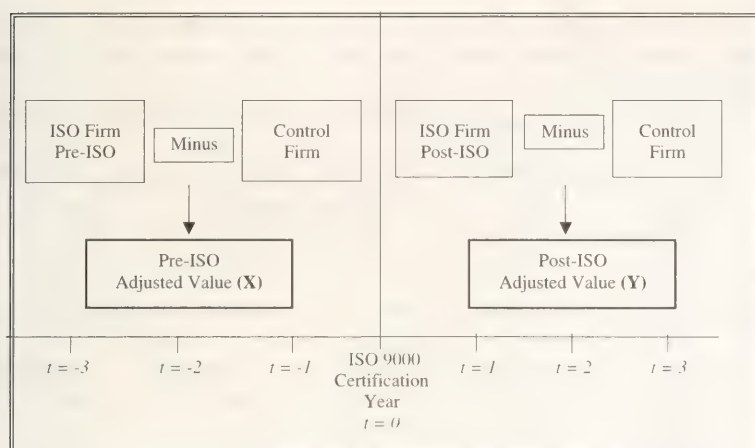


Fig. 1. Design for computation of test variables.

(profit margin/return on sales) as an internal source of gains, revenue (sales growth) as an external source, and profitability (earnings per share) as overall financial performance giving returns to shareholders. All three measures of performance indicate whether ISO 9000 certification is a value-increasing event that is associated with real economic gains. The focus on efficiency, revenue and profitability is consistent with prior studies and the theoretical relationships between ISO 9000 certification and financial performance advanced earlier. Since the hypotheses are directional, all tests of improvements in performance are based on a one-tailed test. Following Fig. 1, Eqs. (1), (2) and (3) test the extent of improvement in performance where ΔGSALES , ΔEPS , and ΔPM reflect differences captured by X and Y in Fig. 1:

$$\Delta\text{GSALES} = (\text{GSALES}_{\text{ISOPOST}} - \text{GSALES}_{\text{NISOPOST}}) - (\text{GSALES}_{\text{ISOPRE}} - \text{GSALES}_{\text{NISOPRE}}) \quad (1)$$

$$\Delta\text{EPS} = (\text{EPS}_{\text{ISOPOST}} - \text{EPS}_{\text{NISOPOST}}) - (\text{EPS}_{\text{ISOPRE}} - \text{EPS}_{\text{NISOPRE}}) \quad (2)$$

$$\Delta\text{PM} = (\text{PM}_{\text{ISOPOST}} - \text{PM}_{\text{NISOPOST}}) - (\text{PM}_{\text{ISOPRE}} - \text{PM}_{\text{NISOPRE}}) \quad (3)$$

where: ISOPOST=performance measure for ISO 9000 certified firm in the post-ISO 9000 certification period; ISOPRE=performance measure for ISO 9000 certified firm in the pre-ISO 9000 certification period; NISOPOST=performance measure for control firm (non-ISO 9000 certified) in the post-ISO 9000 certification period; NISOPRE=performance measure for control firm (non-ISO 9000 certified) in the pre-ISO 9000 certification period; GSALES=growth in net sales measured over the 3-year period either in the pre-ISO or post-ISO certification period; EPS=earnings per share defined as operating income after tax divided by number of ordinary shares issued; and PM=profit margin defined as earnings before interest, tax, and extraordinary items divided by net sales.

Table 2

Mean differences between ISO 9000 certified and non-ISO 9000 certified firms (*n* for mean value calculation=384 firm-years)

Panel A: Three-year mean differences between ISO 9000 certified and non-ISO 9000 certified firms prior to certification

Variable	ISO	Non-ISO	<i>t</i> -value	<i>p</i> (two-tailed)	<i>p</i> (one-tailed)
GSALES [#]	0.575	0.452	0.653	0.518	ns
EPS	0.202	0.305	-0.641	0.526	ns
PM	0.076	0.081	-0.167	0.869	ns

Panel B: Three-year mean differences between ISO 9000 certified and non-ISO 9000 certified firms following certification

Variable	ISO	Non-ISO	<i>t</i> -value	<i>p</i> (two-tailed)	<i>p</i> (one-tailed)
GSALES [#]	0.221	0.036	1.057	0.298	ns
EPS	0.208	0.048	2.366	0.024	<0.01
PM	0.036	-0.048	2.082	0.045	<0.025

Panel C: Control-firm adjusted mean differences between the 3-year pre-ISO 9000 certification period and 3-year post-ISO 9000 certification period

Variable	Pre ISO <i>X</i>	Post ISO <i>Y</i>	<i>t</i> -value	<i>p</i> (two-tailed)	<i>p</i> (one-tailed)
GSALES [#]	0.134	0.187	-0.209	0.836	ns
EPS	-0.103	0.161	-1.770	0.086	<0.05
PM	-0.005	0.085	-2.078	0.045	<0.025

GSALES=3-year net sales growth; EPS=operating income after tax divided by number of ordinary shares issued; PM=earnings before interest, tax and extraordinary items divided by net sales. ns=not significant, #=after removal of outlier effects, *X* and *Y*=refer to Fig. 1.

4.4. The data

The financial reports of the 35 ISO 9000 certified companies and 35 non-ISO 9000 certified companies were obtained for up to 3 years prior and 3 years after the ISO 9000 certification year. Fifty-two companies had data for the complete 6-year period and 18 companies had data for four continuous years (see Table 1). Therefore, a total of 384 firm-year data were used. All data were hand collected.

5. Results

Panel A in Table 2 presents mean-difference statistics for the three performance measures for the period prior to certification. The data shows that none of the 3-year average performance measures are significantly different.⁶

⁶ I removed two outliers (greater than two standard deviations from the mean) from GSALES. These related to the non-ISO group. The matched ISO firms were also removed. Including the outliers resulted in a significant ($p < 0.10$) difference in GSALES with higher growth for the non-ISO group (mean=7.216) than the ISO group (mean 0.568). Subsequent analysis excludes the outliers.

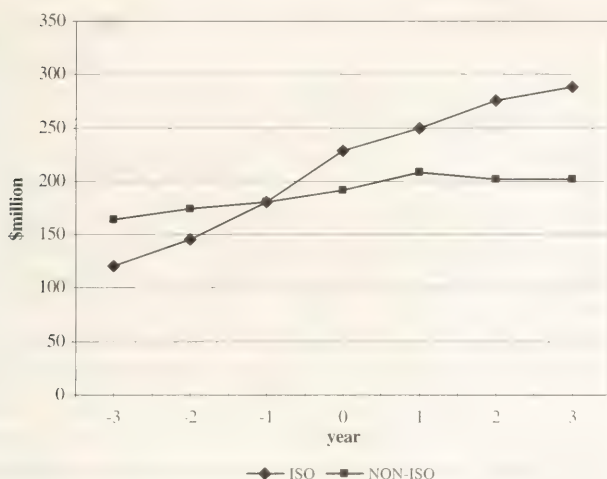


Fig. 2. Total revenue mean value plots for ISO 9000 certified vs. non-ISO 9000 certified firms.

Panel B of Table 2 presents the results for differences in performance in the post-ISO certification period. The data suggests that the ISO 9000 certified companies had significantly better performance for GSALES, EPS, and PM. The differences were significant for EPS ($p < 0.01$) and PM ($p < 0.05$). In order to identify the extent of improvement in performance and control for differences due to economic factors, tests were conducted on the control-adjusted performance measures (X and Y shown in Fig. 1). The results for these tests are shown in Panel C.

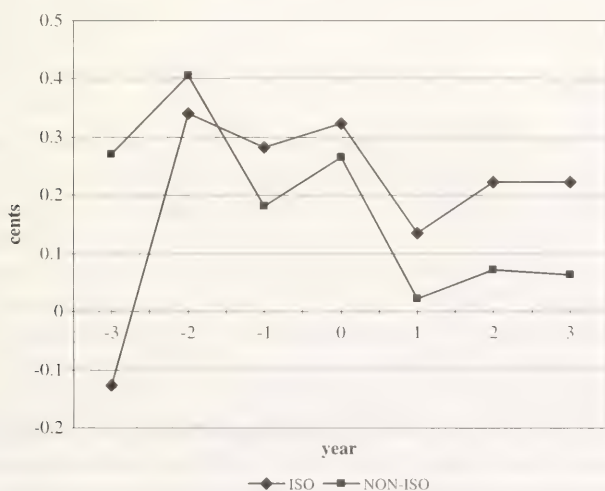


Fig. 3. EPS mean value plots for ISO 9000 certified vs. non-ISO 9000 certified firms.

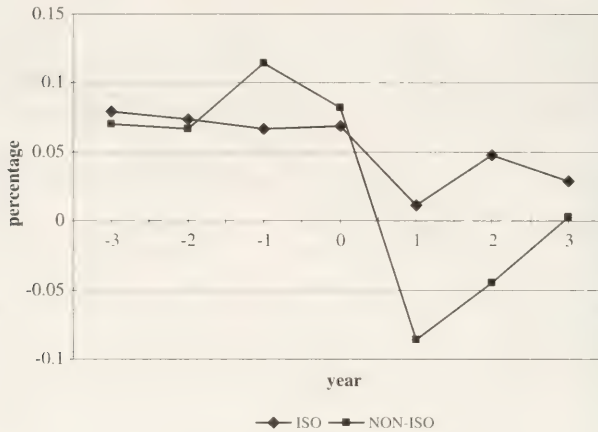


Fig. 4. Profit margin mean value plots for ISO 9000 certified vs. non-ISO 9000 certified firms.

When differences of the pre-mean (X) and post-mean (Y) for the three performance measures are considered, GSALES is not significantly different. EPS and PM however show significant ($p < 0.05$) differences. The difference in the control-adjusted performance measures for EPS and PM show that ISO 9000 certified companies significantly improved their performance over the pre-ISO period and perform better than their matched non-ISO 9000 certified company.

The tabulated financial performance results are supported by trajectories reported in Figs. 2, 3 and 4. Fig. 2 shows ISO 9000 certified firms report increasingly greater total revenues than non-ISO 9000 certified firms in the years following certification. Similarly, trajectories for EPS and PM in Figs. 3 and 4, respectively, show differences between the ISO 9000 certified firms and non-ISO 9000 certified firms in the years following certification.

5.1. Multivariate analysis

There are two limitations of the univariate tests reported above. First, it does not control for other factors that affect firm performance. Second, the mean difference test assumes that the rate of change in the pre-ISO 9000 certification measures is equivalent to the post-ISO 9000 certification measures. I address these limitations through a multivariate analysis by regressing post-ISO certification performance on pre-ISO certification performance, company size (SIZE: log of total assets), major source of sales revenue (SOURCE: foreign=1 or local/regional=0), age of the company (AGE: number of years listed on SGX or SESDAQ), and ISO status (ISOStatus: ISO 9000 certified=1 and non-ISO 9000 certified=0). I include AGE because Finley and Buntzman (1994) argued that the age of a company influences its performance. Company SIZE is included to control for size effects on performance. SOURCE of sales was included because Singapore companies have domestic and international markets and these can influence their performance and motivation for seeking ISO 9000 certification. Three OLS

regressions were estimated for each performance measure. The models took the following general form:

$$\text{Post-ISO}_{\text{Perfi}} = \alpha + \beta_1 \text{SOURCE} + \beta_2 \text{SIZE} + \beta_3 \text{AGE} + \beta_4 \text{Pre-ISO}_{\text{Perfi}} + \beta_5 \text{ISOStatus} + \varepsilon \quad (4)$$

Where Perfi represents each of the three performance measures; GSALES, EPS, and PM. Since Hypotheses 1 to 3 posited greater financial performance of ISO 9000 certified firms relative to non-ISO 9000 certified firms, the coefficient of interest is β_5 and the test criteria is $\beta_5 > 0$. The coefficient of interest, β_5 , measures the change in the mean value of the relevant performance value ($\text{Post-ISO}_{\text{Perfi}}$) if a firm is ISO 9000 certified relative to a firm not certified, after controlling for the influence of other factors likely to affect performance. Table 3 presents the regressions results.

For each financial performance measure, the pre-ISO 9000 certification performance measure is statistically significantly associated with the post-ISO 9000 certification performance. These observations confirm the belief that past performance is related to future performance and that such effects need to be controlled. They also confirm that prior studies are limited to the extent that they have not isolated the effects of prior performance on post-ISO 9000 certification performance and have overstated certification effects.

The coefficient, β_5 , on the variable of interest, ISOStatus , is positive and statistically significantly associated with GSALES ($\beta_5 = 0.130$, $t = 2.249$, $p < 0.05$), EPS ($\beta_5 = 0.279$, $t = 2.577$, $p < 0.05$), and PM ($\beta_5 = 0.282$, $t = 2.393$, $p < 0.05$). The results for ISOStatus suggests that after controlling for prior performance and other factors, ISO 9000 certification is significantly associated with performance. These results are consistent with the three research hypotheses that collectively posit post-ISO 9000 certification performance is greater than the pre-ISO 9000 certification performance.

Table 3
OLS results for effect of ISO 9000 certification on financial performance

Variable	Expected	GSALES Beta (<i>t</i> value)	EPS Beta (<i>t</i> value)	PM Beta (<i>t</i> value)
Constant	?	37.500 (0.609)	34.615 (1.290)	22.869 (1.613)
SOURCE	?	-0.016 (-0.270)	0.068 (0.619)	-0.019 (-0.157)
SIZE	+	0.180 (2.281)**	0.256 (2.230)**	0.062 (0.497)
AGE	?	-0.036 (-0.606)	-0.147 (-1.309)	-0.198 (-1.623)
Pre-ISO _{Perfi}	+	0.751 (10.178)***	0.360 (3.364)***	0.183 (1.577)*
ISOStatus	+	0.130 (2.249)**	0.279 (2.577)**	0.282 (2.393)**
Adj. R^2		0.790	0.231	0.084
Model F		51.445***	5.152***	2.257*

Post-ISO_{Perfi} = $\alpha + \beta_1 \text{SOURCE} + \beta_2 \text{SIZE} + \beta_3 \text{AGE} + \beta_4 \text{Pre-ISO}_{\text{Perfi}} + \beta_5 \text{ISOStatus} + \varepsilon$.

SOURCE = 1 for majority foreign sales and 0 for regional/local sales; SIZE = log of total assets; AGE = number of years listed on SGX/SESDAQ; Pre-ISO_{Perfi} = Pre-ISO GSALES: 3-year mean net sales growth for the Pre-ISO certification period, Pre-ISO EPS: 3-year mean earnings per share for the Pre-ISO certification period, and Pre-ISO PM = 3-year mean profit margin for the Pre-ISO certification period; and ISOStatus = 1 for ISO 9000 certified and 0 for non-ISO certified firms. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. All tests one-tailed except as indicated.

Furthermore, β_5 suggests that ISO 9000 certification increases the mean value of GSALES by 13%, EPS by 28% and PM by 28%. These effects suggest that the benefits of ISO certification come largely from internal efficiencies rather than from external sources such as growth in sales. In a highly competitive market and mature ISO context such as Singapore, benefits of ISO are more likely to flow from internal sources. The ISO companies appear to have significantly improved their performance relative to their non-ISO counterparts through a genuine commitment to and implementation of quality-improvement processes. These results also suggest that improvements to performance in mature ISO contexts are likely to result from continuous enhancements to internal business processes.

5.2. *Sensitivity analysis*

I explored the effects of industry membership and year of ISO 9000 certification on the results reported in Table 3. Since the Singapore government provided incentives to companies in the building and construction industry that attained ISO 9000 certification, it is possible that the motive for such companies differs from the motives for companies in other industries seeking ISO 9000 certification. In addition, companies in the manufacturing industry may seek certification in response to customer demands. I classify companies into three broad industry groups; construction, manufacturing, and service and test for industry effects using two dummy variables in the OLS (Eq. (4)). For the three performance measures I found that the results (not tabulated) pertaining to the effects of ISO 9000 certification are consistent with those reported in Table 3. That is, ISO 9000 certification continues to have a positive and significant (at least at $p < 0.025$) effect on post-ISO 9000 certification performance after controlling for industry effects.⁷

Similarly, for year effects I used a dummy variable that was coded 1 for firms that attained ISO 9000 certification in 1994 and 0 otherwise. In 1994, 11 (31%) of the companies in my sample attained ISO 9000 certification, whereas other years had similar occurrences of certification. Inclusion of year effects in the OLS (Eq. (4)) did not affect the results relating to the effects of ISO 9000 certification on post-ISO 9000 certification. The year effect was also not significant ($p > 0.10$) for any of the three performance measures. Inclusion of industry and year effects together in the OLS (Eq. (4)) produced results consistent with their effects when isolated.

5.3. *Self-selection bias test*

The results reported above ignore self-selection inherent in the ISO 9000 certification decision. If firm characteristics that motivate ISO certification are associated with better financial performance, then it is likely that the results observed overstate the effects of ISO 9000 certification on performance. Following Kinney and Wempe (2002) and Maddala (1977), I investigated effects of endogeneity using a two-stage self-selection procedure. In

⁷ The construction industry variable had a negative and significant ($p < 0.05$) effect on post-ISO 9000 performance for PM and EPS, while the manufacturing industry variable had a negative and significant ($p < 0.052$) effect on post-ISO 9000 performance for GSALES.

the first stage, I employed the following PROBIT analysis of ISO 9000 certification choice where the variables are as previously defined:

$$\text{ISO}_j = \alpha + \beta_1 \text{SOURCE}_j + \beta_2 \text{SIZE}_j + \beta_3 \text{AGE}_j + \beta_4 \text{GSALES}_{\text{PRE}j} + \beta_5 \text{EPS}_{\text{PRE}j} + \beta_6 \text{PM}_{\text{PRE}j} + u_j \quad (5)$$

I included SOURCE, SIZE, and AGE for reasons explained earlier. I included the three pre-ISO 9000 certification measures of financial performance because firms with superior performance are likely to seek certification to maintain their performance and, due to their superior performance, they would be able to afford such initiatives. It is also possible that firms with lower performance seeking superior performance may attain certification. For example, firms expanding their market may seek ISO certification for strategic purposes while those seeking to improve efficiency may also go for certification. ISO 9000 certification and improvements to internal business processes are likely to benefit such firms. ISO was coded 1 for firms that attained certification and 0 otherwise. The unreported results indicated no significant effect for any of the variables at $p < 0.10$. This suggests that the sample firms were relatively homogenous. The second stage test comprised of separate analysis for the two sub-samples of ISO 9000 certified and non-certified firms. The following model was estimated for each of the three financial performance measures:

$$\text{Post-ISO}_{\text{Perfi}} = \alpha + \beta_1 \text{SOURCE} + \beta_2 \text{SIZE} + \beta_3 \text{AGE} + \beta_4 \text{Pre-ISO}_{\text{Perfi}} + \beta_5 M_{\text{ISO}(\text{NISO})} + \varepsilon \quad (6)$$

In Eq. (6), M_{ISO} and M_{NISO} are selectivity variables. For the ISO certified sub-sample equation, M_{ISO} is $-f(\beta'Z)/F(\beta'Z)$ and for the non-certified sub-sample M_{NISO} is $f(\beta'Z)/(1-F(\beta'Z))$. $\beta'Z$ is the prediction from the first-stage PROBIT model and $f(\cdot)$ and $F(\cdot)$ are the density and distribution functions of the standard normal distribution.⁸ The test condition for selectivity bias is a negative and significant β_5 . The unreported results indicated that for each of the three performance measures for both sub-samples β_5 was not significant at $p < 0.10$. Thus, there is no evidence to suggest that self-selection bias affects the results.

6. Conclusion

This study sought to investigate whether ISO 9000 certification is associated with financial performance measures at the organizational level. The study makes several contributions to the literature. First, using a sample of 35 ISO 9000 certified firms across a range of industries and 35 non-ISO certified companies matched on size and industry, I investigated whether ISO certification was associated with improvements

⁸ For a comprehensive discussion of the self-selection bias tests, refer to Maddala (1977, pp. 351–366, 1983, pp. 257–290).

(as opposed to differences between ISO and non-ISO firms at a point in time) in objective measures of financial performance such as EPS, Profit Margin, and Growth in Sales. I employed an appropriate design that permitted investigating the extent of improvement in performance following ISO certification. Second, the relationship between ISO 9000 certification and performance was investigated in an emerging market that had a mature ISO outlook. A mature ISO context enabled me to study the real benefits of ISO 9000 certification arising from improvements to the internal business processes rather than due to a “first mover” effect. In doing so, this study provides the first reliable evidence of the impact of ISO 9000 certification on financial performance at the organizational level.

The results of this study provide evidence that ISO 9000 certification is associated with improvements in financial performance. They suggest that ISO 9000 certification does bring benefits to the firm and its stakeholders. Specifically, the multivariate tests showed that ISO 9000 certification is associated with significant improvements in profit margin, growth in sales, and earnings per share. However, the effect of ISO 9000 certification was greater on profit margin than on growth in sales. This suggests that the improvement in overall performance is attributed largely to improvements in internal business processes. Thus, in a mature ISO context such as Singapore, ISO 9000 certification appears to affect firm performance through internal sources focused on improving quality-related processes. It appears from the data analyzed in this study that ISO 9000 could be an important strategic initiative because it does impact the bottom line through enhancements to internal business processes. Firms not certified but considering ISO 9000 certification are likely to benefit financially from attaining ISO status. Finally, the evidence here also suggests that ISO 9000 has credibility and supports the literature on the self-rated benefits of ISO 9000.

There are a few limitations in this study. First, the results of this study are not generalizable to non-listed companies and SMEs. Future research could consider such companies because they play major roles in world economies. However, data availability is likely to limit such investigations. Second, I cannot rule out the possibility that other variations in firm characteristics and endogenous factors influenced the observed performance differences.⁹ More complex and intricate models are required to explore such effects and are left to future research. Third, due to the lack of objective and sufficient information, the study did not examine other financial measures such as inventory turnover, cost of goods manufactured/services provided, and internal and external failure costs that could more directly capture the effects of ISO 9000 certification. Other financial performance measures such as EVA could be considered. Future research could investigate the causal effects of ISO certification on non-financial measures and consequently on financial measures. Fourth, the period of the study was one where Singapore companies implemented other quality initiatives such as JIT, total quality management, and cellular manufacturing technology. The extent to which these practices varied between the ISO and non-ISO certified companies and

⁹ This is a common, inherent limitation of studies examining the association between quality initiatives and performance (see also Balakrishnan et al., 1996; Ittner & Larcker, 1995; Kinney & Wempe, 2002; Simmons & White, 1999).

within the ISO certified firms could not be determined. Therefore, the results of the study must be interpreted cautiously. Future research could explore the effect of quality initiatives and ISO certification on financial performance. Finally, no attempt was made to investigate the effect of types of ISO 9000 certification on performance due to limited information and the small sample size. This is another issue that could be explored in future research.

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A SPECIAL SECTION:

Accounting Developments around the World

Editor's Note:

This department is one of two new sections offered by The International Journal of Accounting.

Each article in this department will focus on challenges facing accounting and auditing development in a given nation. The plan is to have only one article in this department per issue.



Accounting development in Pakistan

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Abstract

This paper examines the origins, growth, and the development of accounting practices and disclosures in Pakistan and the factors that influenced them. We trace the early days of accounting in the Indian subcontinent and discuss the British colonial influence. We examine the development of accounting in Pakistan through three eras: Independence through 1971, Post 1971–1984, and 1984 to present. We describe how the colonial past and later the international financial institutions such as the Asian Development Bank and the International Monetary Fund played key roles in shaping accounting and reporting practices of the country. Pakistan's adoption of International Financial Reporting Standards as national standards has not led to improvement in the quality of financial reporting. We argue that Pakistan, even though classified as a common law country in literature, exhibits most of the properties of code law countries. We conclude that lack of investor protection (e.g., minority rights protection, insider-trading protection), judicial inefficiencies, and weak enforcement mechanisms are more critical to explaining the state of financial reporting in Pakistan than are cultural factors. This insight has policy implications for developing countries that are making efforts to improve the quality of the financial reporting of their business entities.

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Keywords: Culture; Colonial; Corporate governance; Accounting practices; International standards; Pakistan

1. Introduction

Recent advances in information and financial technology have focused attention on the ideas of global business strategy and alliances. How well the outside world understands

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the business practices of a particular country could determine the difference between a successful or a failed outcome—especially if the country is an emerging economy such as Pakistan. An integral part of this understanding is to determine how a country's business entities measure, summarize, and finally report their economic transactions to their stakeholders. This is the primary focus of this paper: the origins and the development of accounting in Pakistan with emphasis on the factors that have influenced accounting disclosures and practices.

Earlier research focused on the development, diversity, and classification of accounting practices of different groups of countries (DaCosta, Bourgeois, & Larson, 1978; Douppnik, 1987; Frank, 1979; Nair & Frank, 1980). A recent review of accounting literature (Douppnik & Salter, 1995; Gernon & Meek, 2001; Meek & Saudagaran, 1990; Mueller, 1967) reveals that important environmental factors that influence accounting practices are the level of economic development, the nature of business enterprises and their relationships with providers of capital, political and economic ties, legal system (common vs. code law), tax laws, inflation levels, and level of education.

Our study contributes to the literature on the development of accounting because Pakistan provides a unique research setting. Pakistan is an Islamic Republic located in a region that has great economic potential. Since 1985, Pakistan has been following International Accounting Standards (now known as International Financial Reporting Standards). Meek and Thomas (2004), note that Islamic nations have been mostly left out of the accounting development research and, this paper contributes to filling this vacuum.

International financial institutions (such as the International Monetary Fund, the Asian Development Bank, the USAID, the World Bank, and the Paris Club) have been involved in the economic development of Pakistan and have vested interests in knowing how their funds (loans, grants, etc.) are allocated to benefit Pakistan's economy. Pakistan offers a promising investing opportunity to foreign investors who wish to diversify their risks by investing in capital markets of other countries.¹

2. Islamic Republic of Pakistan—a profile²

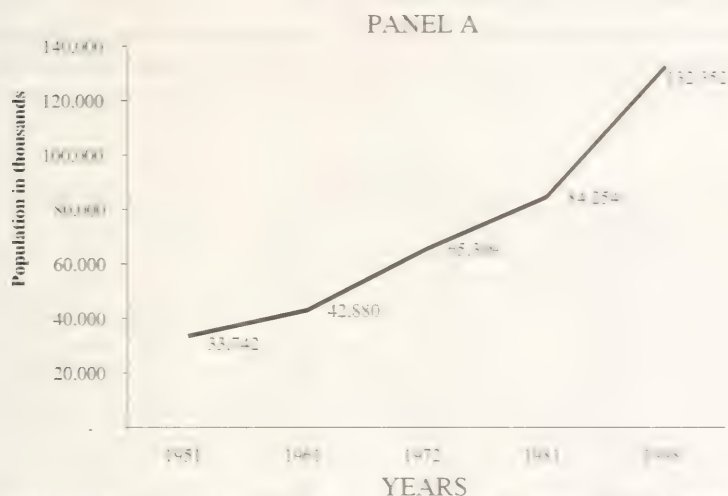
Pakistan, a nation of more than 140 million people is situated in South Asia. Pakistan was previously a part of the British colonial Raj. In 1947, the Indian Sub-Continent was partitioned into two sovereign States—India and Pakistan. An unresolved dispute over Kashmir (a Muslim-majority state of the undivided India) led to several wars between Pakistan and India. Until 1971, Pakistan was comprised of two parts (West Pakistan and East Pakistan) separated by almost 1000 miles of India's territory. In 1971, following a war with India, the country's eastern wing declared itself as an independent country called Bangladesh.

Geographically, Pakistan (as it stands now) stretches out 1000 miles north from the Arabian Sea; its breadth varies between 150–400 miles. For the last four decades

¹ <http://edition.cnn.com/2002/BUSINESS/asia/12/31/asia.stox.2002/>. In fact, Pakistan's stock market in Karachi was termed by American news network, CNN as Asia's best performing market in 2002 (up more than 112%).

² Some information about Pakistan has been drawn from "A note on Pakistan" by Professor Wasif M Khan of Lahore University of Management Sciences.

Pakistan's population has been growing at an alarming rate, averaging close to 3% annually. As shown in Exhibit I, the population has increased fourfold since independence (population data is for West Pakistan, now called Pakistan) and the growth rate has averaged around 2.8% (see Exhibit I, Panel B) since 1981. According to the latest census



Source: Federal Bureau of Statistics, Statistics Division, Government of Pakistan

PANEL B

Year	Population (million)	Growth Rate
1981	85.09	3.06
1982	87.67	3.03
1983	90.30	2.99
1984	92.96	2.95
1985	95.67	2.90
1986	98.41	2.86
1987	101.18	2.82
1988	103.99	2.77
1989	106.84	2.73
1990	109.71	2.69
1991	112.61	2.63
1992	115.54	2.60
1993	118.50	2.56
1994	121.48	2.51
1995	124.49	2.47
1996	127.51	2.43
1997	130.56	2.38
1998	133.62	2.30
1999	136.24	2.19
2000	139.14	2.13
2001	142.01	2.06
2002	144.85	2.00
2003	147.66	1.94

Source: Federal Bureau of Statistics, Statistics Division, Government of Pakistan

Exhibit I. Panel (A) Population and population growth rate in Pakistan (in thousands). Panel (B) Pakistan's population growth rates (in millions).

conducted in 1998, rural population has declined from 71.7% in 1981 to 67.5% in 1998. This shift in population is exerting tremendous pressure on the urban infrastructure leading to wide spread problems typical of urban slums. Pakistan's gross domestic product has grown an average of 5% over the last five decades (see Exhibit II, Panel A and Panel B). In some years, such as in 1970–71, 1992–93, 1996–1997, the GDP growth rate was significantly less than the population growth rate.

Majority of the population lives in the rural areas, and relies on an agriculture-based economy. Wheat (a staple food), cotton, and rice are the main agricultural products.

PANEL A

Year	Growth rate	Year	Growth rate
1951-52	-1.80	1977-78	7.73
1952-53	1.72	1978-79	5.53
1953-54	10.22	1979-80	7.33
1954-55	2.03	1980-81	6.40
1955-56	3.53	1981-82	7.56
1956-57	2.98	1982-83	6.79
1957-58	2.54	1983-84	3.97
1958-59	5.47	1984-85	8.71
1959-60	0.88	1985-86	6.36
1960-61	4.89	1986-87	5.81
1961-62	6.01	1987-88	6.44
1962-63	7.19	1988-89	4.67
1963-64	6.48	1989-90	4.44
1964-65	9.38	1990-91	5.42
1965-66	7.56	1991-92	7.57
1966-67	3.08	1992-93	2.10
1967-68	6.79	1993-94	4.37
1968-69	6.49	1994-95	5.06
1969-70	9.79	1995-96	6.60
1970-71	1.23	1996-97	1.70
1971-72	2.32	1997-98	3.49
1972-73	6.80	1998-99	4.18
1973-74	7.45	1999-00	3.91
1974-75	3.88	2000-01	2.22
1975-76	3.25	2001-02	3.36
1976-77	2.84	2002-03	5.08

Source: Federal Bureau of Statistics, Statistics Division, Government of Pakistan

PANEL B

			1950-51 to 1959-60	1960-61 to 1969-70	1970-71 to 1979-80	1980-81 to 1989-90	1990-91 to 1999-2000
GDP (fc)	Global Average		4.5	5.4	3.9	3.2	2.3
GDP (fc)	Pakistan		3.14	6.77	4.84	6.11	4.44
Agriculture			1.73	5.07	2.37	4.37	4.49
Industrial Sector			7.72	9.92	5.50	8.05	4.00
Services Sector			3.53	6.74	8.26	5.92	4.56
GDP	(mp)	at constant prices	--	6.69	5.59	3.41	7.75
GDP	(mp)	at current prices	3.76	10.25	17.39	13.80	14.01

Source: Federal Bureau of Statistics, Statistics Division, Government of Pakistan

Exhibit II. Panel (A) Annual real growth rate of gross domestic product. Panel (B) Ten-year average real growth rates (%) in GDP decades of 1950s, 1960s, 1970s, 1980s, and 1990s.

Agriculture still contributes slightly over 25% to GDP, employs around 44% of the work force, and is the main source of foreign exchange earnings. In fact, the rate of agricultural growth dominates other components of overall economic growth. Manufacturing is the second largest sector of the economy accounting for 17% of the gross domestic product. Major industrial products include textile and apparel, leather, cement, food and allied, paper and board and chemical, rubber and plastic. Cotton and the cotton textile industry are the backbone of Pakistan's industrial economy. It continues to enjoy the status of the largest industry and commands comparative advantages in resource utilization. It employs the largest number of the

PANEL A

	2000-2001	2001-2002	2002-2003
	(Million Rupees)		
Total	539,070	560,947	652,294
Cotton Fabrics	60,486	69,297	78,665
Cotton Yarn and Threads	62,975	57,165	54,342
Synthetic Textiles	31,911	25,232	33,534
Rice	30,849	27,509	32,433
Sports Goods	15,919	18,623	19,579
Petroleum & Petroleum Products	10,833	11,764	14,507
Leather	13,723	14,740	13,733
Woolen Carpets & Rugs	16,877	15,122	12,690
Medical Instruments	7,293	8,896	8,767
Fish	7,994	7,746	7,867
Fruits & Vegetables (including juices)	6,072	6,492	6,696
Raw Cotton	8,072	1,502	2,873

Source: Federal Bureau of Statistics, Statistics Division, Government of Pakistan

PANEL B

	2000-2001	2001-2002	2002-2003
	(million rupees)		
Total	627,000	634,630	714,372
Mineral Fuels, Lubricants & related materials	198,414	176,233	184,204
Machinery & Transport Equipment	121,164	135,254	171,904
Chemicals	111,259	114,930	126,404
Manufactured Goods classified chiefly by material	51,632	60,999	71,772
Crude Materials except fuel	37,162	52,079	53,964
Animal or Vegetable Oil and Fats	25,265	29,121	40,654
Food and Live Animals	52,669	32,262	29,000
Miscellaneous Manufactured Articles	15,208	17,605	21,380
Commodities & Transaction not classified	14,049	15,974	14,720
Beverages and Tobacco	178	172	368

Source: Federal Bureau of Statistics, Statistics Division, Government of Pakistan

Exhibit III. Panel (A) Pakistan's recent exports-principal commodities (in million Rupees; 1 US\$ = 60 Rupees; 2002 average rate). Panel (B) Pakistan's imports-commodity/major groups (in million Rupees; 1 US\$ = 60 Rupees; 2002 average rate).

Foreign Trade

	Export	Imports
	(thousand rupees)	
1951-52	921,925	1,473,886
1956-57	698,217	1,516,034
1961-62	542,869	2,236,256
1966-67	1,297,323	3,625,658
1971-72	3,371,393	3,495,366
1976-77	11,293,875	23,012,175
1981-82	26,269,865	59,481,537
1986-87	63,354,879	92,430,787
1991-92	171,727,714	229,889,408
1996-97	325,313,469	465,001,242
2001-02	560,947,000	634,630,000

Source: Federal Bureau of Statistics, Statistics Division, Government of Pakistan

Exhibit IV. Pakistan's foreign trade (thousand Rupees) (1 US\$=60 Rupees; 2002 average rate).

industrial labor force (38%), is the major source of foreign-exchange earnings (60%), and accounts for 27% of the value-added in the manufacturing sector. Panel A of Exhibit III shows the recent (2000–2003) exports of principal commodities. The major finished-products exports include cotton-yarn, cotton-fabrics, knitwear, bed-wear, readymade garments, synthetic textiles, carpets, sports goods, leather manufactures and surgical instruments. Panel B of Exhibit III show the most recent (2000–2003) primary imports, which include petroleum products, agricultural and other chemicals, machinery and transport equipment, and food items. Exhibit IV provides an overall summary of foreign trade since 1951. The country has experienced large trade deficit since 1951, which is typical of underdeveloped countries.

3. Historical perspective

History of accounting in the subcontinent is ancient. Gladwin (1796) suggested that in India in 1583 there was a Hindu method of accounting before the adoption of the Persian mode. In Hamilton's (1798) opinion the Hindu method of accounting used by Bengali traders was a double-entry system. Lall Nigam (1986), drawing support from Hamilton (1798), contends that the system used by Indian traders was a *predecessor* to the Italian method and was transported to Italy by Indian exporters. Although Nigam could not present any physical evidence to support his claim (see Nobes, 1987), Indians, even back in 1191, were using a bilateral form of accounting, which may not be a double-entry system (Michael & Nandy, 1992).

3.1. The corporate laws

Formal accounting, as we understand it today, came to the Indian subcontinent (accompanied by the concept of limited liability and statutory audit), in the middle

of the 19th century during the British rule, when the *Companies Acts of 1850 and 1857* were initially enacted. The Acts required that the companies should submit their accounts including half-yearly audits and auditors' reports. These Acts were followed by the *Companies Act 1883* which required detailed audit guidelines in term of appointment, remuneration and duties of auditors (Saeed, 1993).

3.2. *Companies Act 1913*

The *Companies Act 1913*, next in a series of corporate laws enacted in the subcontinent, mandated that every company maintain books of accounts with respect to: (1) sales and purchases, (2) receipts and payments of money, and (3) assets and liabilities of a company. Under the requirements of this law, no person should act as an auditor of the company unless he/she held an auditor's certificate granted by the provincial government. The central government, however, held the right to issue this certificate to members of certain professional bodies, namely: the Institute of Chartered Accountants in England and Wales (ICAEW), Institute of Chartered Accountants of Scotland (ICAS), and Institute of Chartered Accountants of Ireland (ICAI), who were immediately recognized as qualified auditors. There were no examinations required for obtaining the practitioner's certificate until 1918, when the Government of Bombay instituted a *Government Diploma in Accounting* and constituted detailed rules regarding the examination and training of those who wanted to obtain the diploma and the license to audit. All provinces in British India soon adopted these rules. It was not until 1932 that the Government of British India framed *auditors certificates rules* to control and regulate the auditing profession. After gaining independence in 1947, Pakistan adopted *as is* the *Companies Act of 1913* and the auditors certificate rules, 1932 (Saeed, 1993).

In 1952, as a first step toward the institutional development of the profession, the practicing accountants (back then called *Registered Accountants*) formed a private body known as the Pakistan Institute of Accountants (PIA) to look after their own interests and to take up the accounting professional matters with the government. With the formation of the Institute of Chartered Accountants of Pakistan (ICAP) in 1961 the accounting profession marked a major post-independence development. This step was the result of persistent pressure from the Pakistan Institute of Accountants, and the government's realization that the profession has grown in stature and importance. Another major development in the institutional structure was the creation of the Institute of Cost and Management Accountants of Pakistan (ICMAP) in 1966 (as a follow up to the formation of Pakistan Institute of Industrial Accountants) to regulate the profession of cost and management accountants (Saeed, 1993).

3.3. *From independence until 1971*

The financial reporting requirements of *Companies Act of 1913* remained in force after the nation gained independence in 1947 until 1971. The disclosure requirements

of the Third Schedule to the *Companies Act* were rudimentary and incomplete in nature.³

In evaluating the financial reporting practices in Pakistan during that period, Qureshi (1975) describes the weaknesses in the specimen balance sheet given in the Third Schedule of the *Companies Act*:

“...It does not suggest a classification of assets according to their nature, such as current assets, fixed assets, intangibles, long term investments and so forth; intangibles like good will, trade marks, patents, etc. are described as fixed assets; and preliminary expenses and underwriters commission lack proper classification. There is no suggestion to classify the capital and liabilities side of the balance sheet into current liabilities, long-term liabilities, and shareholder's equity. Profit or deficit is not shown as part of or deduction from stockholders equity, instead, the deficit appears separately on the asset side of the balance sheet. Similarly, the un-appropriated balance of profit is listed as an item of liability and not as part of equity. The provision for bad and doubtful debts is shown as a reserve and not as deduction from receivables.”

Additionally, Qureshi (1975) identifies other weaknesses in financial reporting practices that included absence of disclosure of accounting policies, failure to maintain distinction between reserves and provisions, and the valuation of assets in the balance sheet at gross value.

“...various sources of revenue were distinguished, but the gross revenue was not broken down by product line, major business activities or by different segments in case of a conglomerate. Valuation of year end inventory was described such as lower of cost or market value but the method applied for relating different cost of products acquired to periodic revenues such as LIFO, FIFO, AVERAGE was not disclosed. Similarly in twenty out of thirty reports that were examined, auditors had relied on certificate given by the management regarding the valuation of year end inventories

For profit and loss accounts, the requirements included disclosure of the following:

1. The amount of gross income (by sources),
2. The amount of gross expenditure (distinguishing the expenses of establishment, salaries, and other like matters),
3. The portion of deferred expenditure that is to be written off,
4. The amount written off for depreciation, and
5. The amount paid to directors and managing agents of the company as remuneration for their services.

For balance sheet, disclosure requirements included:

1. A summary of property and assets of the company disclosing their general nature and how the value of fixed assets has been arrived at,
2. A summary of capital and liabilities of the company disclosing their general nature, and
3. Disclosure in the above two categories should conform to the contents of Form F (specimen balance sheet) as given in the Third Schedule of the *Companies Act*.

and no audit report had mentioned the fact that inventories were not covered by their opinion.”

3.4. Post 1971–1984

In 1970, the Securities and Exchange Authority, a semi-autonomous body created by the government, developed certain rules (that became effective in 1972) to improve financial reporting practices in the country primarily through disclosures. For the first time, the publication of semi-annual accounts for listed companies was made mandatory. Equally important was the requirement to disclose transactions between the associated companies describing the aggregate sales, purchases, and balance transfers.

Pakistan became a member of The International Accounting Standard Committee (IASC) shortly after its formation in 1974. Since Pakistan have not had any national accounting standard of its own, the Institute of Chartered Accountants of Pakistan (ICAP) encouraged its members to recommend to their corporate clients to prepare their financial statements in conformity with international accounting standards. Use of international accounting standards was not mandated for listed companies, until the enactment of the *Companies Ordinance 1984, Section 234* for listed companies only. Unlisted companies are still not required to comply with the requirements of the IAS (now known as International Financial Reporting Standards, IFRS). Annexed to the *Companies Ordinance 1984* were the Fourth and Fifth Schedule, providing disclosure requirements for listed and unlisted companies, respectively. Listed companies were hence required to comply with requirements of the Fourth Schedule as well as IFRS.

3.5. Companies Ordinance 1984

Companies Ordinance 1984 included some critical requirements, given the corporate context of the country. The three critical requirements were: (1) disclosures of the remuneration of directors, chief executives, and auditors (where auditors' compensation segregated between audit fees and other services), and (2) regulating related party transactions. This section also required companies to ensure that the total amount of advances/commissions to associated company should not exceed 20% of the paid in capital plus free reserves of the lender company. In order to monitor organizations in this regard, a clause was inserted in the Fourth Schedule of the *Companies Ordinance 1984* that required companies to disclose maximum balances due to and due from associated companies at the end of any month during the year, and (3) finally, in reports accompanying their accounts, company directors were now required to disclose the following:

- (a) Any material changes and commitments affecting the financial position of the company that have occurred between the end of the financial year of the company to which the balance-sheet relates and the date of the report;
- (b) Any changes that have occurred during the financial year concerning the nature of the business of the company or of its subsidiaries, or in the classes of business in

which the company has interest, whether as a member of another company or otherwise, unless Corporate Law Authority (now known as Securities and Exchange Commission of Pakistan) exempts the company from making such disclosures on the ground that such disclosures would be prejudicial to the business of the company;

- (c) The fullest information and explanation in regard to any reservation, observation, qualification or adverse remarks contained in the auditor's report;
- (d) Information about the pattern of holding of the shares in the form prescribed;
- (e) The name and country of incorporation of its holding company, if any, where such holding company is established outside Pakistan;
- (f) The earning per share; and
- (g) Reasons for incurring loss and a reasonable indication of future prospects of profit, if any.

In addition, through an amendment made in 1999 in the *Companies Ordinance*, directors were also required to disclose information about default on payments of debt, if any, and reasons, thereof.

3.6. 1984 to present-developments

Financial statements of listed companies continued to improve into 1990s with a number of new international accounting standards issued by the IASC (now known as the International Accounting Standards Board IASB). These standards were issued as part of a core standards project specified by International Organization of Securities Commissions (IOSCO) to IASC before it would consider endorsing IAS for cross-border listing of companies on the international stock exchanges of the world. Most of these standards were adopted by SECP (Securities and Exchange Commission of Pakistan) on the recommendation of ICAP along with many old standards that were not adopted earlier.

3.7. Issuance of the Code of Corporate Governance

Another major development in the financial reporting system is the Code of Corporate Governance issued on March 28, 2002. Several features of the Code have specific reference to financial reporting and auditing issues.

The contents of *Directors Report* to members, in addition to the requirements of *Section 236 of Companies Ordinance 1984* must include:

- A statement with regard to the compliance with IFRS as applicable in Pakistan for the preparation of financial statements and disclosures of any departures from the same;
- Information regarding the system of internal control being adequately designed, implemented and monitored;
- The director's view regarding the going-concern ability of the entity;
- A statement to the effect that there have been no material departure from best practices of corporate governance, as detailed in listing regulations;

- A summary of key operating and financing activities data for the last six years;
- An explanation if dividends have not been declared;
- Pattern of shareholders-disclosing the name-wise details of i) institutional shareholders, ii) holdings of directors and their spouses, iii) details of associated companies, and iv) shareholders holding more than 10% of the total holdings.

The Code requires listed companies to publish quarterly, un-audited financial statements. These have to be accompanied by a director's review of the affairs of the company during the quarter. This is the first time that listed companies in the country are required to report quarterly results. Prior to this, listed companies were required to publish half-yearly accounts that could be un-audited as well.

Listed companies are required to ensure that annual audited accounts are circulated not later than four months from the end of financial year of the company. The earlier requirement as per the *Companies Ordinance 1984* for both listed and non-listed companies was 6 months.

Companies are required to include in the annual report a statement of compliance with the Code of Corporate Governance. The company auditors are required to review and give an opinion about the compliance. Given the nature of the work, auditors give a moderate assurance on statement of compliance with the Code of Corporate Governance.

In summary, we provided a brief account of evolution of the institutional structure of accounting and financial reporting in the country. In the next sections we shall explore the effects of different environmental factors that shaped the accounting system of the country.

4. Economy, politics and the legal system

Since gaining independence, Pakistan had to accede to forces of secession and independence and in that process lost East Pakistan, which is now Bangladesh. The country has had successive military governments, which assumed powers after the dismissal or overthrow of civilian governments; in the last 25 years, six elected governments have been dismissed or overthrown. The ensuing uncertainty has significantly and negatively affected the economy, corporate governance structure, and the nature of business and industry.

The 1960s were noted for the government's attempt to foster import substitution industries through direct control by supporting industrial projects. Several industrial family-owned companies emerged in a wave of capital intensive and mostly low value-added businesses, mainly in textiles. Much of the industrial growth achieved by these family-owned enterprises was greatly helped by the government in the form of industrial licensing procedures, overvalued exchange rates, tariff protection against imports, input subsidies, and preferential access to capital (White, 1974). Foreign assistance played a major role in the development of the economy. As shown in Exhibit V, the amount of foreign loans and grants doubled during the 1960s increasing from 842 million dollars in the 1950s to around 2.4 billion dollars in the decade of the 1960s. During the decade of development (1958–68), GNP rose from Rupees 31.439 million to Rupees 48.280 million,

Disbursements of Foreign Economic Assistance

Year	Loans	Grants	Total
(Million US Dollars)			
1951–1960	192	650	842
1960–1965	1,232	1,162	2,394
1965–1970	2,324	719	3,043
1970–1978	5,096	634	5,730
1978–1983	4,418	1,375	5,793
1983–1988	5,158	2,025	7,183
1988–1993	9,540	2,541	12,081
1993–1997	9,214	1,008	10,222
1997–2001	4,555	2,918	7,473

Source: Federal Bureau of Statistics, Statistics Division, Government of Pakistan

Exhibit V. Foreign economic assistance to Pakistan (million US dollars) (Years 1951–2001).

a rate of growth of 6% during the years 1965–68, fueled by the industrial output in all the sectors especially in textile, jute and sugar.⁴ The number of joint stock companies increased from 3853 in 1957–58 to 8654 in 1967–68.⁵ Pakistan's efforts to survive and develop were so successful that it was described as the most remarkable example of state and nation building in the post-World War II era.⁶ But according to some critics, there was a downside to this economic development.

“Pakistan attained economic development but at the cost of social justice. GNP grew rapidly, but so did skew-ness in the distribution of income and wealth, rendering the rich richer and the poor poorer. Industrial expansion was remarkable but economic power became concentrated in the hands of a small elite class. Gross domestic savings as a proportion of GNP rose markedly, but it consisted mostly of undistributed corporate profits plus depreciation allowances, and came about in response to such fiscal incentives as the tax holidays. Even dividends in majority of cases were payments within controlling group or group of companies, which were reinvested.”⁷

The development of stock market was made possible with the development of Karachi and Dhaka (now the capital of Bangladesh) Stock Exchanges. The closely held corporations discouraged small investors to become owners for fear of diffusion of ownership. Trading on the stock exchange therefore represented transactions between select groups of people.

⁴ *Investment in Pakistan—background and perspective* (Karachi: The Department of Investment Promotion and supplies, Government of Pakistan, 1968), p. 23.

⁵ *25 years of Pakistan in Statistics 1947–72* (Central Statistical Office, Economic Affairs Division, Ministry of Finance, Planning and Development, Government of Pakistan, 1972), p. 155.

⁶ *The Times*, London, February 6, 1966.

⁷ *Role of private sector in Pakistan's development*, pp. 52–53.

During the 1970s, we observe a significant reaction to much of the perceived or real inequities created by the market friendly economic policies of the 1960s. The popularly elected government of Mr. Z.A. Bhutto, led a wave of nationalization, sending the industrial groups from the 1960s into virtual hibernation and even into exile. Nationalization of commercial banks in 1974 opened a new chapter in political patronage; industrial loans were sanctioned to political or ethnic cronies, often in wanton disregard of prudent economic sense and sound decision-making (Shahid-ur-Rehman, 1998). To finance large industrial projects, the government launched development finance institutions such as the National Development Finance Corporation (NDFC). After the civilian government was overthrown in a military coup in 1977, the previously nationalized financial institutions continued to be run by the government. In a White Paper issued by the military government in 1979 on misuse of banks by political government, it was stated,

“... the aggregate amount of advances of half million rupees and above which were classified as doubtful or irregular in the State Bank Inspection Report of December 31, 1975 is over Rs 1340 million. Advances of half million rupees or above given by the banks after nationalization which have been found to be bad, doubtful or irregular abinitio amounted to Rs 510 million. It also found that nationalized commercial banks sanctioned loans worth Rs 562 million under irresistible political and administrative pressure or influence between 1974–77.”

The lingering Afghan civil war of the 1980s brought almost four to five million Afghans to Pakistan seeking refuge which resulted in a unique set of problems such as the proliferation of weaponry and a rampant spread of drugs. At the same time, Pakistan reaped economic dividends in the form of increased foreign assistance—grants and loans. Some of this aid was used to revive the private sector, further concentrating wealth in a few hands, particularly in the textile sector. Although Pakistan has been receiving foreign loans from international donor agencies since the 1950s, during the 1980s the total external debt rose to approximately 15 billion US dollars.

The 1990s were most notable for the country's multiple experiments in democracy, and rapid expansion in the capital markets resulting in an increased number of listed companies on the three major stock exchanges of the country. As shown in Exhibit VI, the number of listed companies increased from a total of 314 to 487. Some important developments of the 1990s were the huge loan defaults by politically connected and influential industrialists, the continued public financial assistance of the resource-draining failed industries, and massive corporate failures. According to Shahid-ur-Rehman (1998), “Three lists of bad loans have been published since 1993, showing an increase in bad loans from Rs 1340 million to Rs 130 billion in January 1997.”

4.1. Formation of securities and exchange commission of Pakistan (SECP)

Increased external debt and the diminished ability of Pakistan to repay it resulted in increased involvement of international donor agencies (such as the Asian Development Agencies and the International Monetary Fund) in the fiscal and monetary policy making of the country. As part of the capital market regulation reforms of the Asian Development

YEAR	No. of listed companies	Listed capital (Rupees in million)	Market Capitalization (Rupees in million)
1950	15	117.3	-
1960	81	1,007.7	1,871.4
1970	291	3,864.6	5,658.1
1980	314	7,630.2	9,767.3
1990	487	28,056.0	61,750.0
2000	762	236,458.5	382,730.4

Source: <http://www.kse.net.pk>

Exhibit VI. Number of listed companies (Rupees in millions) (Years 1950–2000) Karachi Stock Exchange, Pakistan.

Bank (ADB), the Securities and Exchange Commission of Pakistan (SECP) was formed in 1999 (under the Securities and Exchange Act of 1997) to monitor the activities of corporate and capital markets and all related players.⁸

SECP succeeded the Corporate Law authority (CLA), which had been administering Corporate Laws in the country since 1981. As a government department to the Ministry of Finance, the CLA lacked autonomy and was a bureaucratic structure that made it difficult to effectively pursue transparency, disclosure and authenticity of operations in the financial sector. The rapid expansion of stock markets during the early 1990s further highlighted the need for an independent regulatory body with full operational and administrative autonomy.⁹

4.2. *The emergence of a nuclear state and its aftermath*

Pakistan's tests of nuclear devices in 1998 resulted in the imposition of various international sanctions. Foreign economic assistance dropped from 10.2 billion US dollars during 1993–1997 to 7.4 billion US dollars during 1997–2002 (see Exhibit V) and the foreign direct investments (already limited) dried up. Consequently, the country's economic indicators worsened. During this period the government made significant attempts to focus on stabilizing rather than growing the economy. This, in turn, led to collapse in investments and an increase in poverty and unemployment. The heavy expense

⁸ The responsibilities include:

1. The issue of securities;
2. Regulating the business of stock exchanges and other security markets;
3. Supervising depository and clearing houses;
4. Registering stock brokers and sub-brokers;
5. Regulating investment schemes and funds;
6. Preventing frauds in securities markets; and
7. Regulating share acquisition and mergers/takeovers of companies.

⁹ Chairman of SECP in the Chairman's Statement accompanying the annual accounts for the Commission for the year ended June 30, 2000.

of debt servicing and defense had a further depressing affect on dismally performing social indicators such as the literacy rate (down to 38%), high population growth rate (averaging around 2.1%) and poor public health.

4.3. *Code of Corporate Governance*

As mentioned in the earlier section of this paper, the SECP introduced a set of proposals in the form of a Code of Corporate Governance (CCG), whereby listed companies would be managed in compliance with international best practices. Pakistan faces the same corporate governance challenges typical of emerging economies: loan-defaults, large-scale tax evasions, non-payment of dividends to shareholders for longer periods of time, and government's ongoing financial and managerial assistance of a large number of distressed industrial units. The purpose of the Code of Corporate Governance (issued in 2002) was not only to address such problems, but also to boost investor's confidence in the functioning of corporate entities, and to induce mobilization of savings through equity and debt markets. The Code was enforced through listing regulations of all three stock exchanges of the country.

4.4. *Economic development periods*

Mueller (1968) suggests that the stage of economic development, type of the economy, and the growth pattern of the economy, can exert an impact a country's accounting practices. Doupnik and Salter (1995) argue that the stage of development affects the type of business transactions that are conducted in a country and the type of economy determines which transactions are more prevalent. On similar conceptual lines, we can relate evolution of Pakistan's accounting practices to three economic development periods—private sector driven economic development, nationalization, and de-regulation/privatization, discussed next.

4.4.1. *Private sector development*

The fairly primitive reporting requirements of the *Companies Act of 1913* continued to remain in force throughout 1960s. The emergence of family-based business groups on the corporate scene (a recurring institutional story in the non-USA business setting) and the heightened concern for wealth concentration became dominant political issues during this period. These concerns were augmented by possible involvement in unethical acts such as, evasion of taxes, lack of distribution of dividends and transfer of funds/profits from one company to another within the group (in the form of advances and loans), and inter-company sales and purchases of goods and services.

It was not until 1972 when the *Securities and Exchange Authority Rules of 1971* issued new rules regulating transactions between associated companies. Listing regulations of Karachi stock exchange added a provision to suspend from trading companies that do not declare dividends for five consecutive years. This provision was in response to minority shareholders' persistent complaint in the 1960s that highly profitable family businesses did not distribute dividends for long periods. Little changed in reality for the minority shareholders for the next two decades. Eventually, through the fiscal budget 1998, an

amendment was made to the *Income Tax Ordinance 1979*, whereby, if a company's retained earnings exceed 50% of the paid up capital, the excess amount will be deemed to be the earnings of the company for the fiscal year and will be taxed accordingly. The Code of Corporate Governance mandated in 2001 that directors disclose the reasons for nondeclaration of dividends in a particular year and give the reasons for incurring losses. This chain of events that initially affected listing regulations and later the tax laws, ended up affecting the accounting system.

4.4.2. *Nationalization era*

During the 1970s there was a major shift in the policy of the popularly elected government of Prime Minister Z.A. Bhutto. A number of large industrial units, banks, and insurance companies were nationalized in order to soothe popular anger against the "twenty-two families" (see White, 1974) that are claimed to control the economy. This radical change in economic and political system could be expected to cause major changes in the accounting practices of the country. But unlike financial reporting in China (Lynford & Li, 1997), there were no changes in the financial reporting framework of Pakistan.

4.4.3. *Deregulation/privatization*

The issue of huge nonperforming loans granted to political cronies by successive governments since 1970 became a major issue in the late 1980s and particularly, in the early 1990s (Shahid-Ur-Rehman, 1998). An amendment to Section 236 of the *Companies Ordinance* on July 27, 1999, required directors to disclose in their report accompanying the annual accounts, information about loan default, and the reasons. However, it still took many years before this particular disclosure item was made mandatory for incorporated businesses in the country.

5. Systems interactions

5.1. *Common vs. code law classification*

International accounting literature has long recognized the prevalence of a particular legal system (common law or code law) to be an important variable affecting the accounting system of a country (Berry, 1987; Fantl, 1971; Nobes, 1983). The literature recognizes that common-law countries are oriented towards fair presentation, transparency, and full disclosure (known as the Anglo-Saxon model). Standard setting is carried out in these countries by bodies in the private sector, and the stock market is the dominant source of financing for corporate entities. By contrast, in code law countries, banks or governments are the main sources of financing and financial accounting is geared towards creditor protection (known as the Continental model). Financial reporting, in these countries, is characterized by low disclosures and an alignment of financial accounting with the tax laws. In addition, governments have a strong influence in setting accounting standards.

Recently researchers have shown a renewed interest in empirically examining the relationship between accounting systems and legal system in various countries. La Porta.

Lopez-de-Salines, Shleifer, and Vishny (1997, 1998, 2000), suggest that the type of legal system a country has predisposes it towards a principal system of finance. That is, a common-law legal framework emphasizes shareholders' rights and offers a stronger investor protection system as compared to that of a code-law legal system. This linkage leads to the development of strong equity markets in common-law countries and weak ones in code-law countries. Consequently, in code-law countries, debt rather than equity is the dominant source of financing.

The case of Pakistan is indeed a puzzle. In the models for accounting practices of different nations, it is placed as a common law country, most likely because of its British colonial past and its adoption of the International Accounting Standards very early on (see Hope, 2003b). In addition, it exhibits some of the properties of a common-law country: two separate sets of reporting requirements (tax reporting and financial reporting); minimal influence of labor (as stakeholder) on corporate governance; and no direct involvement of government in standard setting. On the other hand, if we examine a little deeper, we find that Pakistan exhibits even more of the characteristics of a code law country. It has a weak equity market, a prevalence of family-owned big businesses (business-groups), strong preference and use of debt as a source of financing (as against use of outsiders' equity), and a general perception of low quality of financial reporting (Baig, 1997). Thus, we can argue equally strongly that Pakistan should be grouped with code-law countries.

5.2. Enforcement predicament

The literature has shown that incentives to produce quality financial statements are low in the absence of effective enforcement mechanisms. The extent to which standards are enforced is as important as the standards themselves (La Porta et al., 1997, 1998; Sunder, 1997, p.167). Hope (2003a) describes enforcement mechanisms as consisting of rule of law, shareholders' protection, insider trading laws, judicial efficiency, and audit spending. Historically, enforcement mechanisms in Pakistan have been rather weak; *Company Law* was considered to be the least administered law. In addition, minority shareholders' protection regulations have traditionally been inadequate. Efforts were made in the 1960s and later to improve the situation, which include enactment of the *Securities and Exchange Ordinance 1969*, *Monopolies and Restrictive Trade practices Ordinance 1970*, *Securities and Exchange rules 1972*, and formation of *Corporate Law Authority* in 1981. Other measures include an amendment in *Chartered Accountancy Ordinance 1961*, and in 1983, the ICAP got its first independently elected president. Some serious measures, to improve the enforcement climate were adopted in late 1990s with the formation of an effective regulatory body called the Securities and Exchange Commission of Pakistan (SECP).

5.3. Enforcement-role of the accounting profession

The Influence and independence of the accounting profession is an indication of the effective enforcement of accounting standards (Ball, Robin, & Wu, 2003). Corporate environment of family-owned and -managed firms in Pakistan pose serious threats to

independence of auditors. In the words of a senior partner of a top-four firm, “It is very difficult to stand against the aspirations of management, if they own more than seventy percent of voting rights.” While litigation against auditors in the West is the most important deterrents against any potential collusion of auditors with management of the audited firm (Coffee, 2001). To the best of our knowledge, there has never been a litigation case against the auditors in Pakistan. Regulatory action by ICAP against its practicing members has been minimal, but the enforcement environment has improved somewhat after the formation of SECP according to the annual report of the SECP.

“The enforcement and monitoring division (EMD) of the SECP during the year under review identified several cases of negligence of statutory auditors where they had failed to act in conformity with the statutory requirements. The audit reports issued by such auditors failed to report material facts about the affairs of companies or otherwise contained untrue statements. Previously, the Commission used to refer such cases to Institute of Chartered Accountants of Pakistan for taking necessary disciplinary action against the concerned auditors. In view of delays noted in disposal of these cases, the Commission decided to invoke the provisions of the Companies Ordinance, 1984 to proceed against auditors for negligence and professional misconduct in conducting statutory audit of listed companies. Accordingly, the EMD initiated proceedings in 25 cases against 20 firms of chartered accountants during the financial year 2002. Penalties were imposed in 21 cases while four cases were pending as of June 30, 2002 (2002 Annual report of SECP).”

ICAP has also become more active in pursuing cases against its practicing members and publicly reprimanding the guilty and publicly disclosing that information. The cases and the actions taken by ICAP and SECP against these audit firms is publicly available information and can cause serious damage to the reputation of firms. There is a wide spread belief in the profession that these measures have definitely improved the quality of financial reporting practices in the country (Ashraf & Khalid, 2005).

Another step in improving the regulatory environment is the Quality Control Review Program (QCR) started in 1987 by Institute of Chartered Accountants of Pakistan with significant impact after the implementation of the Code of Corporate Governance, which required auditors of listed firms to achieve a satisfactory rating in the Quality Control Review Program. Every audit firm has to submit a complete list of the audit clients as of June 30th of a particular year to ICAP, and to undergo a Quality Control Review at least once in 2 years. The Professional Standards Compliance Department (PSC) selects five (maximum) audit engagements, which are preferably listed companies and/or high-risk audit engagements, from the list of clients of each audit firm under review. One of the five selected clients is chosen for QCR on the day of the review. Audit working papers and correspondence files are reviewed and a report is issued stating whether the quality of work performed is or is not in accordance with International Standards on Auditing. If a report is not satisfactory, a revisit is performed after 6 months. During the year 2003, of 370 registered audit firm, 85 practicing firms were given satisfactory ratings under the program. As of June 30, 2003, the total number of ICAP members is 3026 of which 270 are sole proprietors and the remaining are in partnerships (composed of two or more partners) for a total of 100 firms (Ashraf & Khalid, 2005).

5.4. Audit fees

Low spending on audit services has always been a concern for accounting profession in Pakistan. According to the partner of one of the top four auditing firms, “this factor severely hampers the quality of audit because at the end of the day we are in the business of selling audit services and low revenue will mean low cost and resultantly poor quality staff and review.” The situation got so worse that ICAP had to issue a circular in 1999 describing minimum audit fee to be paid to auditors. In summary, in Pakistan, in the absence of strong incentives for the main constituents of the accounting system, regulation has had the most pronounced effect on accounting practices.

6. Effects of taxation laws on accounting

More than half of the listed firms on the Karachi Stock Exchange are family-owned and operated (widely known to be business group firms). Companies listed on the stock exchanges pay substantially low rates of tax as compared to companies that are not listed (see more on this in first schedule of the *Income tax Ordinance, 2001*). Arguably, reduced tax burden is an incentive for listing, but in exchange companies have to accept more stringent disclosure requirements. Tax evasion by the family-owned and-managed companies has been a widespread concern since the 1960s and it is claimed that the economy and tax evasion have risen to 10.6% and 11.4% of the Gross Domestic Product (GDP), respectively, in the past 7 years.¹⁰ On this issue Ashraf (1979) notes that

“It is obvious that exaggerating costs, manipulating production records and under-invoicing sales are far more profitable techniques than any cost control technique or cost analysis.”

To a larger extent this has been a problem with a number of under-developed countries. According to Nashui (1984), Turkish companies are accused of preparing three sets of financial statements, one set for external reporting, the second set for tax authorities that shows very depressed income (to avoid a large tax liability), and the third set for banks and other lending organizations that provides a very rosy picture of the financial position of the company (to persuade lenders to extend the required credit). It is widely believed in the business circles that the notion of triple financial statements is also practiced in Pakistan. In order to tackle the problem, the government of Pakistan made an amendment in 1990 whereby business organizations are now required to pay a minimum tax of 0.5% of total turnover irrespective of the level of profit or loss.¹¹

In addition to understating revenues and overstating expenses, companies also manipulate other areas of financial disclosures in Pakistan. For example, companies

¹⁰ http://www.dailytimes.com.pk/default.asp?page=story_2-2-2003_pg7_32.

¹¹ Section 80 D of *Income Tax Ordinance 1979*/Section 113 of *Income Tax Ordinance 2001*.

aggregate any “miscellaneous or other income” with other expenses to avoid the taxes levied by income tax laws. A recent case of tax considerations affecting corporate disclosures became apparent when mutual funds and Modaraba¹² companies asked SECP to relax the application of certain provisions of IAS 39. Under these provisions, they were required to value financial instruments held for trading at market value and to treat the increase in market value of these instruments as income of the period. Modaraba companies and mutual funds are given tax exemption only in cases when they distribute 90% of their income as dividends which goes to show the impact of tax avoidance on the accounting practices over the last five decades.

7. Political and economic ties

Gernon and Meek (2001) argue that many accounting professions patterned after the U.K. model. As noted by Briston (1978), almost all of colonial territories that experienced substantial degree of industrial development under the British rule were subject to the *British Companies Act* with the usual reporting and auditing requirements. The *British Companies Act of 1913* remained in use in Pakistan until 1970.

7.1. British colonial influence on the accounting profession

The United Kingdom's trained accountants have been a major source of influence on accounting practices in its former colonies. In fact, Britain is the only major colonial power to transfer both its accounting ideas and accountants (Gernon & Meek, 2001). Although central government in the Indian subcontinent held the right to issue the certificate to practice, the members of British professional accounting bodies such as ICAEW, ICAS, and ICAI were immediately recognized as qualified auditors in the Indian subcontinent (Saeed, 1993). An inflow of the members of professional accounting bodies from the United Kingdom continued even after partition. In fact, even today in Pakistan, members of the professional accounting bodies from the United Kingdom, the Institutes of Chartered Accountants of Canada, Australia and New Zealand continue to enjoy certain privileges.

7.2. Role of international financial reporting standards

Immediately after the formation of the IASC in 1973, Pakistan was among the first group of countries admitted for associate membership to the IASC 1974.¹³ ICAP members were encouraged to recommend to their clients to apply International Accounting Standards (IAS) while preparing their financial statements. To comply with the

¹² It is an Islamic mode of finance where one person contributes capital and the other his skills to run a business. The profit or loss of the business is shared on agreed upon basis and in accordance with Islamic injunctions. Currently, there are 32 Modaraba companies in Pakistan.

¹³ <http://www.iasb.org/about/history.asp>.

requirements of IAS, *Companies Ordinance 1984* added Section 234 stipulating that the listed companies should comply with the requirements of those IAS that are notified by the Corporate Law Authority (now SECP). Through a notification in 1986, 19 International

- IAS 1 Presentation of Financial Statements - (August 6, 1986)
- IAS 2 Inventories - (August 6, 1986)
- IAS 7 Cash Flow Statements - (August 6, 1986)
- IAS 8 Net Profit or Loss for the Period, Fundamental Errors and Changes in Accounting Policies. - (August 6, 1986)
- IAS 10 Contingencies and Events Occurring After the Balance Sheet Date - (August 6, 1986)
- IAS 11 Construction Contracts - (August 6, 1986)
- IAS 12 Income Taxes - (August 6, 1986)
- IAS 14 Segment Reporting - (August 6, 1986)
- IAS 16 Property, Plant and Equipment - (August 6, 1986)
- IAS 17 Leases - (August 6, 1986)
- IAS 18 Revenue - (August 6, 1986)
- IAS 19 Employee Benefits - (August 6, 1986)
- IAS 20 Accounting for Government Grants and Disclosure of Government Assistance - (August 6, 1986)
- IAS 21 The Effects of Changes in Foreign Exchange Rates - (August 6, 1986)
- IAS-22 Business Combinations - (July 18, 2001)
- IAS 23 Borrowing Costs - (November 20, 1996)
- IAS 24 Related Party Disclosures - (November 20, 1996)
- IAS 25 Accounting for Investments - (November 20, 1996)
- IAS 26 Accounting and Reporting by Retirement Benefit Plans - (June 18, 1998)

- IAS 27 Consolidated Financial Statements and Accounting for Investments in Subsidiaries - (May 12, 1998)
- IAS 28 Accounting for Investments in Associates - (May 12, 1998)
- IAS 30 Disclosures in the Financial Statements of Banks and Similar Financial Institutions - (January 27, 2000)
- IAS 31 Financial Reporting of Interests in Joint Ventures - (August 15, 1997)
- IAS 32 Financial Instruments: Disclosure and Presentation - (August 15, 1997)
- IAS 33 Earnings Per Share - (May 12, 1998)
- IAS 34 Interim Financial Reporting - (January 27, 2000)
- IAS 35 Discontinuing Operations - (September 14, 2000)
- IAS 36 Impairment of Assets - (July 18, 2001)
- IAS 37 Provisions, Contingent Liabilities and Contingent Assets - (September 14, 2000)
- IAS 38 Intangible Assets - (September 14, 2000)
- IAS 39 Financial Instruments: Recognition and Measurement - (July 18, 2001)
- IAS-40 Investment Property - (January 23, 2002)

The following standards have not yet been adopted:

- IAS 15 Information Reflecting the Effects of Changing Prices – Has been classified as non-mandatory by IAS Committee and has not been adopted by Pakistan.
- IAS 29 Financial Reporting in Hyperinflationary Economies – Not relevant in the Pakistan context and has not been considered for adoption.
- IAS 41 Accounting for Agricultural property.

Exhibit VII (continued).

Accounting Standards were adopted (see Exhibit VII). These included IAS 1, 2, 4–14, and 16–21. As shown in Exhibit VII, Pakistan, eventually adopted almost all International Accounting Standards (or IFRS) that were issued by the IASC (or IASB). These IFRS were based on the fair presentation/full disclosure model, which assumes outside shareholders as primary users of financial statements. This practice of adoption of IAS

Most IAS's have been adopted in full, however, after some minor deviations as follows:

- 1) IAS 1 – Not mandatory for banks and insurance companies. The accounting requirements for banks are covered in the Banking Companies Ordinance 1962 and insurance companies are required to have separate classes of insurance accounts under the Insurance Ordinance 2000; only minor deviations from IASs.
- 2) IAS 16 – Allows for a revaluation of an asset to be offset against the devaluation of another asset, i.e., the offset is not restricted for the same asset, in accordance with IAS.
- 3) SECP has decided to grant relaxation to the NBFCs (that provide investment finance services, discounting services and housing finance services) from the application of IAS 39 and IAS 40 until further orders.

Source: Institute of Chartered Accountants of Pakistan

Exhibit VII (*continued*).

without any modification or without any attention towards the local needs is fairly common among less developed countries (Hove, 1986).

8. Effect of international financial institutions

International financial institutions have been involved in the development of the Pakistan economy and its institutions since the 1950s, mainly because of close political and defense ties Pakistan developed with the United States and the western world during this era. The involvement of international donor agencies and financial institutions in the financial policy-making process in Pakistan, therefore, has been there since independence (see more in Islam, 1972). Foreign assistance to Pakistan increased significantly in the late 1970s and early 1980s when the Soviet Union invaded Afghanistan and Pakistan was given the status of a front-line state in this war (see Exhibit V, showing foreign economic assistance to Pakistan since 1951). Similarly, after the terrorists attack of September 11, 2001 Pakistan became a front-line state and reaped the benefits of significant foreign assistance in the form of grants, donations, relaxation in the repayment terms of old loans, and some write-offs of existing loans.

One of the major interests of the international agencies naturally has been to ensure effective management of the industrial entities in the country. The Institute of Cost and Management Accountants of Pakistan was the first professional accounting body to receive financial as well as technical assistance from the Government of Canada for its

expansion in 1958, but without substantial impact on the financial reporting system. The more important influence may be attributed to the Asian Development Bank, which launched in 1977 a capital market development program. The focus of the program was on mobilization and efficient allocation of long-term financing through a diversified and competitive capital market. Of the important initiatives are the automated trading system and settlement mechanisms, development of the corporate debt market, development of new financial instruments, and most importantly, restructuring and transforming of ineffective Corporate Law Authority into the Securities and Exchange Commission of Pakistan whose role in accounting development has been discussed earlier.

9. Level of education

Radebaugh (1975) and Mueller (1968) suggested that the general level of education and/or the accounting profession of a country affect accounting practices. According to Douppnik and Salter (1995) a simple educational environment prevents development of sophisticated accounting practices. An examination of the level of education of accountants in the early years of ICAP's history shows that all members of Pakistan Institute of Accountants became ICAP members immediately after its formation. Thus, the early members of ICAP were educated and trained at British professional accounting institutes. Later on, the majority of members were trained at local accounting firms and passed locally administered examinations. Members knowledge of developments in the international sphere may not have been well developed; there was no research conducted in the local universities regarding emerging accounting information needs and current practices and resources are rarely available to stimulate these activities. Even nowadays, there are hardly any books written by Pakistani authors on accounting subjects. As noted by Saudagaran and Diga (1997) these factors are the primary reasons that developing economies readily adopt IFRS. In addition, it is much cheaper and quicker to acquire overnight credibility for a country's financial reporting among international users (Ball et al., 2003). Adopting International Accounting Standards linked the Pakistani accounting profession to a source from where they could update their financial reporting system, and enhance their knowledge of the latest accounting approaches and concepts on measurement and reporting of financial events.

10. Culture and accounting development

Recent research postulates that culture plays a role in developing and changing an accounting system (Gray, 1988; Hofstede, 1980). We argue that the major changes in the financial reporting system of companies in Pakistan came only when there were changes in either the underlying legal rules and regulations and/or better *enforcement* of these rules through active monitoring of corporate players by the regulatory authorities. We feel that the colonial background of a country is a key explanatory variable that has to be explicitly

incorporated in to any model that tests the relationship between culture and financial reporting systems. For the purpose of our study, we conclude that the effect of culture on the accounting system in Pakistan cannot be explained unambiguously because of her colonial past. In this respect, our observation is more in line with the finding of Jaggi and Low (2000) who conclude that cultural values do not predict disclosure levels once legal origin is considered.

11. Summary and conclusion

The primary purpose of our paper is to explore the factors that have influenced the evolution, the origins, growth and development of accounting in Pakistan. We traced the early days of accounting in the Indian subcontinent and described the British colonial influence over the accounting of the newly independent state of Pakistan. It is worth noting that the *Companies Act of 1913* remained in force in Pakistan for more than three decades beyond independence and it was not until 1984 that major revisions to the Act were made to the *Companies Ordinance 1984*. We traced the development of accounting through three eras: (1) Independence through 1971, (2) Post 1971 1984, and (3) 1984 to the present. We describe how the colonial past and later the international financial institutions such as Asian Development Bank and the International Monetary Fund played a key role in shaping accounting and reporting practices of the country. Pakistan readily adopted International Financial Reporting Standards as national standards in 1985; however, the quality of financial reporting did not improve with the mere adoption of these standards. For an emerging economy like Pakistan, we argue that it is the enforcement mechanisms (interaction between legal system, accounting system and sub-system within the accounting system) that are keys to improving the quality of financial reporting.

We argue that models to describe reporting practices of different countries based on legal systems, i.e., common vs. code law (Berry, 1987; Fantl, 1971; Hope, 2003b; Jaggi & Low, 2000; Nobes, 1983) are not suitable for the financial reporting systems of a developing country such as Pakistan. Pakistan, even though is classified as a common law country in (Hope, 2003b), exhibits more of the properties of code-law countries. We conclude that lack of investor protection (minority rights protection, insider-trading protection), judicial inefficiencies and weak enforcement mechanisms are more critical to explaining the financial reporting practices in Pakistan than are cultural factors. These legal factors are linked to the enforcement environment and affect the “preparers’ incentives.” This insight has policy implication for developing countries that are trying to improve the quality of the financial reporting of their corporate entities.

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Book Review Section

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Book reviews

Graham W. Cosserat, *Modern auditing*, Second ed., John Wiley & Sons, Ltd., Chichester, UK, 2004 (ix+681 pp)

Modern Auditing, the book under review, is unique. It is an English publication based on the Australian text by Gudarshan Gill and Graham Cosserat. Gill and Cosserat based their text on an American Auditing text by Water G. Kell and Richard E. Ziegler (now authored by William C. Boynton and Walter G. Kell). Therefore, we have an English text based on an Australian text, adopted from an American text, and reviewed by an American college professor. The book and this review are truly an international effort.

The objective of *Modern Auditing* is to bring to the reader a comprehensive and integrated approach to auditing using an international frame of reference. The author uses International Auditing Standards throughout the text to equip students with the background necessary to participate in auditing anywhere in the world. The anticipated audience for the text is undergraduate and graduate students or practitioners.

1. The structure of the text

The text consists of 17 chapters, with an average length of 34 pages per chapter. Covering the entire book in a 15-week semester would be tight, but it could be done with careful planning. If I were to adopt the book, I would probably only cover 14 or 15 chapters, particularly the first time through, and, at this point, I am not sure which chapters I would leave out, because they are all relevant.

The first four chapters provide an introduction to auditing. They cover the role of the auditing profession in today's environment, the purpose of financial statement auditing, the ethical expectations of the auditing profession, and the legal responsibility auditors have to the users of their work. Chapters 5 to 9 deal with the basic techniques used in planning and performing an audit. Coverage in these five chapters consists of discussions on audit risk and evidence, client and engagement acceptance, the nature of internal control and control risk, audit sampling, and the design of substantive tests. Chapters 10 through 13 present substantive tests for the basic transaction cycles such as sales and receivables, purchasing, payables and payroll, inventory (stocks), tangible fixed assets, and cash and investments. Chapters 14 and 15 discuss the wrap-up of the audit and preparing audit reports. The last two chapters look at the future of auditing. Chapter 16 deals with auditing issues concerning e-commerce. Chapter 17 covers topics such as the role of the auditor in corporate governance, information technology topics including

advanced financial software and XBRL, and emerging issues such as the auditor's role in discovering fraud and forensic auditing.

The structure of each chapter is similar. Each begins with a brief chapter overview and presents a list of learning objectives followed by a list of the international professional auditing standards applicable to the chapter's subject area. A list of learning-checks follows each of the chapter's sub-sections, which summarize the key concepts presented in that particular section. End-of-chapter material consists of multiple-choice, discussion, and professional-application questions.

The multiple-choice questions appear to be the product of the author. While they are adequate, in my opinion adopting multiple-choice questions from professional exams would add to the text's appeal. The professional-application questions mainly come from professional exams in the United Kingdom and other countries. The answers to the multiple-choice and the professional-application questions are at the end of the book, which in my opinion can be helpful to students.

2. Presentation style and coverage

The writing style is easy to follow and appropriate for the intended audience of the book. The author explains concepts in a conversational manner, very similar to what you would expect to observe in a classroom setting. The coverage of topics is complete and contains well thought out examples to illustrate the concept presented.

The learning-checks that follow each sub-section are a good feature. Each sub-section ends with five to eight individually numbered sentences that present the reader with a key point from the preceding discussion. These key points help reinforce the concepts the author wants the student to retain and could help streamline the student's review process when preparing for an exam.

The concepts of audit risk and internal control are at the very center of the audit process. In addition, with the passage of the Sarbanes-Oxley Act, internal control has become a critical area of study in both undergraduate and graduate auditing courses. Given the current environment, I was particularly interested in how this text approached these two areas. Chapter 5 presents the auditor's evaluation of audit risk, and Chapter 7 deals with internal control.

Chapter 5, titled "Audit Risk and Audit Evidence," introduces the concepts of audit risk, materiality, evidence, and audit objectives and procedures. The discussion on the audit-risk model is comprehensive and does an excellent job of explaining how inherent, control, and detection risk interrelate. Figure 5-2 (p. 137) is a nice illustration showing how these risks relate to audit risk. The discussion on materiality is comprehensive, covering (a) materiality at both the financial statement and the account balance class of transaction level, (b) the quantitative and qualitative considerations of materiality, (c) different approaches to allocating financial statement materiality to various accounts, (d) the relationship between materiality and audit evidence, and (e) the difference between setting materiality levels at the planning and the final review stages of an audit. The sub-section on audit objectives explains the relationship between audit objectives and management assertions. Table 5-4 (p. 150) does an excellent job of showing how specific

audit objectives relate to specific management assertions. The discussion on audit evidence covers the attributes of evidence, as well as presenting the various types of evidence auditor's use. In my opinion the last section of the chapter, which relates auditing procedures to types of evidence and management assertions, provides students with a sound understanding of how these critical concepts fit together in the audit process.

Chapter 7 covers internal control. The discussion first establishes the importance of internal control within an entity and then identifies and discusses the components that form an integral part of an internal control system. The concepts of reasonable assurance as well as the reasons why the concept is important are covered. The chapter presents a short discussion of internal controls in a computer information system, which includes a comparison of internal controls in a computerized information system to a manual system. Because of the importance and pervasiveness of computerized information systems today, the coverage seems a bit light. In my opinion, there is probably enough interest in this area to warrant a separate chapter covering this topic. However, I realize that there are often tradeoffs in deciding on the level of coverage of different subjects in textbooks. The chapter does include examples of questionnaires and a discussion of how flowcharts are useful in documenting the auditor's understanding of the internal control system. The discussion about making the preliminary assessment of control risk is well organized: it contains two tables showing how to use different types of controls to mitigate potential misstatement. The chapter also includes examples of ways to test the effectiveness of those controls. Overall, I found the coverage on audit risk and internal control comprehensive and well organized, and the tables and other illustrations informative and useful.

Chapter 9 covers designing substantive tests and includes a thorough discussion on how the auditor uses the audit-risk model to determine an acceptable level of detection risk and the relationship between detection risk and the level of substantive testing performed by the auditor. Chapters 10 through 13, on substantive tests, begin by presenting management assertions and relating audit objectives to each assertion at the transaction class and account-balance level. Each chapter includes a discussion of the internal controls associated with the cycle and relates the control to the relevant audit objective.

The final two chapters cover auditing e-commerce and contemporary topics in auditing. The e-commerce chapter does not go into much detail but does provide an adequate overview of the nature of auditing e-commerce. Chapter 17, on contemporary topics in auditing, covers corporate governance, fraud and forensic auditing, current developments in financial software, the Internet, and environmental auditing.

Overall, in my opinion, *Modern Auditing* meets its objective of bringing the reader a comprehensive and integrated approach to auditing using an international frame of reference, and it does so in a style that students and instructors will find comfortable to use.

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Eisuke Sakakibara, *Structural Reform in Japan: Breaking the Iron Triangle*, Brookings Institution Press: Washington, DC, 2003, ISBN: 0-8157-7676-4, xix+167 pp.

This book is the prescription for revitalizing the economy in Japan. The author is Japan's former Vice Minister of Finance and known as "Mr. Yen" for his strong influence over global currency markets. Japan has suffered through a decade-long recession in the 1990s—the so-called "lost 10 years". Sakakibara's message is that effective reforms need to be implemented simultaneously and comprehensively across various sectors.

1. Objective

The objective or goal of this book is "to present a rough sketch of the areas where genuine structural or institutional reform should be simultaneously implemented in order to achieve overall success for the Japanese economy" (p. xvi). It should be noted that his primary intention is to present a broad outline of the areas needing structural reform. This work does not attempt to develop sophisticated economic policy nor demonstrate the empirical data to support his view. The focus is specifically on the economic aspect.

2. Environmental factors

Sakakibara contends that "the major cause of the decade-long stagnation of the Japanese economy was the lack of profitable investment opportunities due to a high cost structure" (p. viii). Why did the Japanese economy have such a high cost structure? It was the result of two major environmental changes: the technological revolution and globalization. These two events proved the *ancien régime* of the "Iron Triangle" to be out-dated and dysfunctional. The only way of curing Japan's languishing economy is to break the Iron Triangle of the Liberal Democratic Party (LDP), the bureaucracy and vested interest groups.

3. Approach

The author emphasizes an "all-encompassing approach" to structural reform in Japan. In this book, the concept of "structure" is used interchangeably with that of "institution" (p. xi). As the Iron Triangle suggests, such institutions or structures are complementary in nature. That is, institutional or structural reform can only be achieved when both economic and political institutions change together. This might be a significant difference from conventional partial reforms such as the financial "Big Bang" and deregulation in various sectors.

4. Structure of the book

This book consists of 12 chapters. The first five chapters provide helpful background information and analysis. The following six chapters present more specific analysis of

such diverse areas as banking, diplomacy, education, government, agriculture and health care. The final chapter provides a future perspective of institutional reforms.

The first two chapters give fruitful insights into the urgent need for structural reform in Japan. Chapter 1 works from the globalization context and deals with why Japan needs structural reform in the age of network globalization: "Network globalization's effect on interpersonal relationships as well as on social structure has led to the destruction of the old order" (p. 7). A new direction needs to be found. A "third path", combining global markets with welfare, is not a clear solution. Asian regional cooperation is also too early in its developmental stages. However, one thing is certain, "Japan still should pursue structural reform in order to maintain its prominent position in Asia, and as the third major power in the world, after the United States and Europe" (p. 10). In other words, "the intention of structural reform is to maintain, and develop in the context of the world's new environment of internationalism, the pluralism of Japan and the rest of Asia, including each country's cultural identity" (p. 11).

Chapter 2 uses a historical perspective, and supports the author's view of Japan's modernization and industrialization from the Meiji Era through the postwar period of high growth. The point is that Japan has established its unique Japanese-style capitalism with a strong cultural flavor throughout its history. One feature of this Japanese capitalist system is vividly reflected in Chapter 3.

Chapter 3 is devoted to the development and decay of the construction state. Heavy investments in public works and construction of highways have certainly played a significant role in developing Japanese-style capitalism. However, the productivity of public works was very low. In addition, the system created a breeding ground for vested interests. Consequently, it "became a hindrance not only to politics but also to economics" (p. 36). This led to internally motivated structural reform. Readers will benefit from the extensive public-works-related data.

Chapter 4 deals with in-depth analysis of the dual structure of Japanese economics and politics. The purpose of the chapter is to understand why breaking the bureaucracy is necessary to implement Japan's structural reform. Sakakibara notes two dual structures. One is the dual structure of the economic system, which is characterized by the coexistence of market mechanisms (the highly productive sector) and socialist policies (low productive sector). Another is the dual structure of the political system, which includes politicians with and without legal authority to draft government legislation (such as party committee members). Unfortunately, these two dual structures interact with each other in the policymaking process. Representatives with vested interests, politicians of various party committees, so-called "zoku" (or "tribe parliamentarians"), and the bureaucracy has a close alliance and plays a significant role in making policy. This decision-making mechanism tends to lack transparency as well as efficiency. Therefore, it is this author's conclusion that, "Japan needs to immediately address structural reform *vis-à-vis* the dismantling of the two dual structures" (p. 56). Sakakibara's logic is clear and sharp. His conclusion is also persuasive. However, resolving the question of how to break the Iron Triangle is not so easy.

Chapter 5 goes on to deal with the Japanese corporate system. According to the author, the Japanese company is now seeking a new transformation in the age of globalization and

information. The Nissan, Toyota and Mitsubishi Corporations are among these companies. Nissan, for example, has implemented revolutionary and fundamental reforms under CEO Carlos Ghosn's strong leadership. The important point is: "this new transformation is neither Americanization nor the surrender to a global standard; rather, it is the process of creating a new kind of Japanese company" (p. 69). The author firmly focuses on the new Japanese corporate system, its unique identity and culture.

The following chapters mainly deal with the specific problems that Japan is now facing. Chapter 6 highlights one of the most crucial issues, the banking system and the problem of nonperforming loans (NPLs). It is Sakakibara's view that "only after the government makes progress in dissolving the system of protection for vested interests, and in resolving the problem of NPLs, can the framework for a new Japanese corporate governance system be created" (p. 85). In this respect, the new governance system will include a combination of main bank governance and governance through the market by institutional investors.

Chapter 7 deals with Japan's postwar foreign policy strategy. Sakakibara criticizes the "number two strategy" and suggests the shift from its U.S.-dependent foreign policy to one more balanced between the East and West. Chapter 8 raises some issues underlying the Japanese meritocracy system, such as the "socialistic" education policy and centralization versus decentralization with respect to regulation and direction. Using the most updated data, the government debate over centralization versus local government is successfully provided with the most up-dated data in Chapter 9. Chapter 10 deals with the new direction of agricultural policy. Excessive income subsidies and pork-barrel policies are strongly criticized. In Chapter 11, the present socialistic health-care system is analyzed and a proposal is made to dismantle the old Iron Triangle of politicians, government and vested interests. Finally, Chapter 12 presents a future perspective of uniquely Japanese institutional reforms.

5. Impressions

This book is devoted to the most up-to-date topics of structural reform in Japan. It is well written and organized. Readers will benefit from numerous examples using real-world data associated with Japanese business and the economy. However, the readers will also be confronted with two difficulties.

One is concerned with the real purpose or intention of implementing structural reform in Japan. In the Preface of the book, as I have already mentioned, Sakakibara seems to support structural reform "in order to achieve overall success for the Japanese economy" (p. xvi). On the other hand, he also declares that "the intention of structural reform is to maintain, and develop...the pluralism of Japan and the rest of Asia" (p. 11). Apparently, the former focuses on economic needs, while the latter puts emphasis on a wider and more profound purpose. Which one is his real intention?

In my judgment, the author's final purpose must be the latter one. In fact, in his previous book, written in Japanese, *Shinseiki heno kouzoukaikaku (Structural Reform toward a New Century)* (1997), Sakakibara concludes that the real problem in attempting structural reform in Japan will be "how to respond to the post-Cold War increase in

globalization after post-Cold War and the advent of the information revolution" (p. 241). His intention is not simply an economic focus, but highlighting "the balance between economic competitiveness and coexistence" (p. 230).

Another issue is how to break the Iron Triangle. It seems easy "on paper", but taking it apart in practice is quite hard to do. When Japan's Prime Minister Junichiro Koizumi came onto the political stage with his reform agenda, the Japanese public expected drastic change in the deep-rooted system. It is said, however, that Koizumi's reform is far from successful. If Koizumi has been unsuccessful so far, the question is, who will be able to make these changes?

6. Audience

This book provides an excellent introduction to understanding some of the unique aspects of Japan's political, economic and business structure. Anyone concerned with the Japanese business system will find the book to be thought provoking and insightful. I strongly recommend it as a worthwhile reading.

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Malcolm, Smith, Research Methods in Accounting Sage Publications, London, 2003, xiv+241 pp.

This book provides an overview of how to conduct research in accounting. The author adopts a practical approach which takes the reader from the initiation of the research idea through to the publication of the research findings. The overall aim is to facilitate the conduct of what the author calls "applied research studies in accounting". Since only empirical accounting research is considered and no attention is given to analytical studies in accounting, a more representative title for the book would be "*empirical* research methods in accounting". A large segment of the book is devoted to the discussion of research "methods". In particular, technical issues are discussed that are associated with the conduct of empirical accounting research, including the most frequently used statistical techniques. The intended readership is wide, including instructors, doctoral students and academics starting their research careers.

The book contains 11 chapters. In the *introductory chapter* Smith starts from the premise that accounting has little theory of its own, no methods of its own, and only a few instruments of its own, and that, hence, it heavily relies on prior research in natural and social sciences to explain what can be observed. Smith borrows from natural sciences to

introduce a theoretical foundation for empirical accounting research, but does not address a rich body of extant accounting theory.

Chapter 2 focuses on the *development of the research idea*. Useful information described in this chapter includes: (a) what constitutes a typical research sequence; (b) the characteristics of a sound research idea; (c) the elements a typical research proposal should include; and (d) the need to develop a conceptual representation of the research project. The remaining pages of the chapter are dedicated to examples of how research ideas originated in the minds of role-model researchers, but again—disappointingly—the examples are taken only from natural sciences, and not from accounting.

In Chapter 3, Smith elaborates on the *hypotheses development and theory stage* of the research project. First, he lists the typical sources of theory in accounting research, namely: economics, finance, and organizational behavior. A more profound description of major insights from these theories that are relevant to accounting would be of tremendous value to the intended readership of the book. On top of that, analytical research findings in accounting also deserve more attention as they are undoubtedly a source of theory for the empirical accounting researcher. A second theme in this chapter is practicalities of the literature search process. Next, a discussion is provided of how the relationship between two variables of interest can be modeled. Subsequently, hypothesis development is described and finally an interesting discussion of some validity issues is provided.

Chapter 4 provides a nice overview of basic issues that relate to *data collection and analysis*. This includes the following topics: sample selection, measurement issues, data management, descriptive statistics, differences in sample means, measures of association and analysis of variance, and multivariate model building. This overview is mainly technical. It would have been more useful to a novice accounting researcher to explain the techniques in this chapter from real accounting research examples, rather than theoretically.

Chapter 5 constitutes a relevant and nice intermezzo as it addresses the increasingly important *ethical considerations* which underpin the conduct of accounting research. In this chapter the reader is invited to execute a quiz about potential ethical dilemmas in accounting research settings, and then gets a discussion of ethical guidelines related to accounting research.

The next four chapters are dedicated, respectively, to different empirical approaches to accounting: experimental, survey-based, fieldwork, and archival. In Chapter 6, four guidelines (Gibbins and Salterio 1996) for good *experimental research* in accounting are discussed in detail: clear problem statement; clear statement of the theory that underlies the process; sound experimental design; recognition of the importance of external validity. Chapter 7 deals with various aspects of *survey research*: design and planning issues; pilot testing; data collection; problems of measurement error and interview techniques. Next, Chapter 8 addresses *fieldwork research*. In particular: case study methods; qualitative protocol analysis; grounded theory; and verbal protocol analysis are discussed. Chapter 9, then, addresses some aspects that are related to archival research. These include: cross-sectional data; time-series data; validity issues; content analysis; and critical approaches to accounting research. All four chapters provide an overview of main issues and thus give a broad, extensive perspective. The intended readership would definitely benefit more from

additional detail. In addition, per empirical approach, one or more prototype studies could have been included and used to illustrate the problems and challenges discussed in the respective chapters.

As an important audience for this book is doctoral candidates, a chapter is devoted to the *supervisor-candidate relationship*. Chapter 10 focuses hereon and describes the mutual responsibilities of both parties. This may be very useful reading to reflect upon for both candidates and supervisors, as typically both parties' expectations do not always coincide. The final chapter is devoted to various aspects of the publication process and addresses questions such as: why publish, where to publish, what to publish, and how to publish.

Overall, this book is very accessible due to its broad perspective and practical approach. The reader gets a clear overview of the sequence of steps that need to be taken in order to have their research published. Throughout the book, she/he is made aware of potential pitfalls that she/he may encounter, and to some extent how to solve them. The book's main contribution is its broad overview of the research process, including guidelines on how to review existing research and offer critiques to articles. This, however, is simultaneously the book's major drawback. This broad, extensive perspective is at the price of a detailed, intensive perspective that novice researchers need to acquire. The author discusses, for example, the most frequently used statistical techniques, without really discussing solutions to statistical problems that may occur. To my taste, also, too few examples from the accounting literature are used. Hence, the book may serve as a guideline to (starting) researchers, clarifying the several steps that need to be undertaken. Other, more specific literature—both from accounting and statistics—will however be needed to solve concrete problems.

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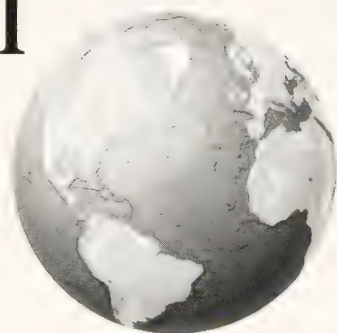


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Global warming, commitment to the Kyoto protocol, and accounting disclosures by the largest global public firms from polluting industries

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Abstract

This study evaluates disclosures on pollution and greenhouse gases by firms domiciled in countries that have ratified the Kyoto Protocol compared to others. The study is based on disclosures made in the annual reports, environmental reports, and websites of 120 of the largest (in terms of revenues) public firms from the chemical, oil and gas, energy, and motor vehicles and casualty insurance industries. The study uses content analysis to construct weighted and unweighted disclosure indices.

The results show that firms from countries that ratified the Protocol have higher disclosure indexes as compared to firms in other countries. Additionally, larger firms disclose more detailed pollution information. Multinational firms that operate in countries that ratified the Protocol but have their home offices in countries that did not are associated with lower disclosures. This lack of consistency in disclosure is not likely to be helpful in informing shareholders about the social responsibility of their investments.

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1. Introduction

With Russia's ratification of the Kyoto Protocol (hereafter, referred to as the Protocol) in 2004, the Protocol went into effect in February 2005. There are still nine nations (including the United States, Switzerland, and Australia) that are resisting ratification of the Protocol. Countries that ratify the Protocol are obligated to enact regulations incorporating the Protocol's provisions on disclosures related to greenhouse gases, i.e., carbon dioxide, methane, and nitrous oxides. A key aspect of this Protocol is that greenhouse gases emitted by vehicles, power plants, and certain types of industrial operations need to be brought to acceptable levels in order to control their global warming effect.

In this paper, we evaluate whether firms from industries that are severely impacted by the Protocol are disclosing information related to the emission of greenhouse gases and how these firms plan to reduce these emissions to the desired levels. We conduct a comparative analysis of the greenhouse gas disclosures made by large firms, generally multinationals, from countries that have ratified the Protocol against disclosures by firms from countries that did not ratify the Protocol but are operating in the ratifying countries.

Multinational firms from countries ratifying the Protocol are expected to be more forthcoming in making detailed disclosures on their greenhouse gas emissions and on their plans to meet the Protocol requirements because they would be evaluated on how well they meet their country's disclosure requirements. Thus, they would have an incentive to keep their investors better informed on their pollution performance. On the other hand, non-ratifying foreign multinationals operating in countries ratifying the Protocol would be likely to take advantage of the unsettled political situation and meet only the minimum disclosure requirements. We conjecture that disclosure policies of these firms are more influenced by the regulations of their home country rather than by the country in which they operate. Our expectation is that firms from countries ratifying the Protocol make significantly more disclosures about their plans to deal with the problem of greenhouse gas emissions compared to firms from countries that have not ratified the Protocol but are operating in the Protocol ratifying countries.

In addition to comparing the Protocol-related total pollution disclosures of firms from the Protocol ratifying and non-ratifying countries, we also evaluate the disclosures on carbon dioxide emissions (CO₂) that are especially emphasized by the Protocol. In particular, we examine whether the association between CO₂ emissions and pollution disclosures is stronger for multinationals from the Protocol ratifying countries compared to other multinationals. Furthermore, we evaluate the impact of firm-specific factors (e.g., return on assets, firm size, and debt–equity structure) on pollution disclosures because these factors may have significant influence on disclosure-related managerial decisions.

The analyses are based on the greenhouse gas disclosures included in the annual reports from 2000 through 2002, environmental reports, and websites of the 120 largest (in terms of revenues) public companies in the world belonging to the chemical, oil and gas, energy, and motor vehicle and casualty insurance industries. We use content analysis to develop the disclosure index and conduct regression analyses to evaluate the association between the disclosure index and an indicator variable for the firms from Protocol ratifying and non-ratifying countries. The analyses are conducted by controlling for the impact of the legal system and the regulatory enforcement level of a country as well as for industry and

country effects on the association between the disclosure index and the independent test variables.

The results indicate that there is a significantly positive association between the disclosure index and firms from countries ratifying the Protocol. This finding confirms the expectation that the firms from Protocol ratifying countries are more forthcoming in making disclosures on greenhouse gas pollution emissions and their detailed plans to deal with the global warming problem. The CO₂ emission disclosures are especially higher for firms from the Protocol ratifying countries. These firms are motivated to keep their shareholders informed about their efforts to meet the Protocol's guidelines and to provide higher disclosures. On the other hand, firms from countries that have not ratified the Protocol do not disclose detailed information on global warming even though they operate in the Protocol ratifying countries.

The results with regard to the firm-specific characteristics show that the greenhouse pollution disclosures are positively associated with firm size; larger firms are making more extensive disclosures compared to smaller firms. The coefficients on ROA (return on assets) and debt/equity show no significant impact of these characteristics on the greenhouse pollution disclosures. We also detect no significant difference in the disclosures among the firms belonging to the different industry groups covered in the study.

The remainder of the paper is organized as follows: In part two, we provide background and the theoretical rationale for the study. The research design, including sample selection, data collection, hypotheses, and research methodology, is discussed in part three. The results are presented in part four, and the conclusion is contained in part five.

2. Background and rationale for pollution disclosures

2.1. Background

As of June 2003, the completion date of this study, 84 nations had ratified the Kyoto Protocol including the European Union (EU), Japan, and Canada. The United States and Russia, the first and third largest pollution emitters, respectively, of carbon dioxide (a key greenhouse gas) had not ratified the treaty (French, 2002). The countries ratifying the Protocol are committing to reduce greenhouse gases by 5% by the year 2012 from their 1990 level (Revkin, 2001). Because the United States has so far decided not to ratify the Protocol and has not made any commitment to reduce greenhouse gases, it is not clear how U.S. multinationals will react to the Protocol's requirements.

We expect the Protocol's requirements to have a significant impact on fossil-burning electric utilities (the major industrial producer of carbon dioxide), chemicals, and oil and gas companies, which are required to reduce emissions by 5% before the year 2012. We also expect an effect on firms from industries that create the products that cause greenhouse gas emissions; these include the manufacturers of motor vehicles, farm equipment, airplanes, and the parts for these products. In order to modify the products so as to reduce emissions, these firms will require creative thinking, planning, retooling and redesigning of their manufacturing processes. Therefore, reducing emissions caused by these products will involve substantial costs and may take longer to achieve. In addition, insurance companies are also likely to be affected by the Protocol because global warming is expected to result in

a number of ecological disasters. Insurance companies that write policies for casualty or business liability insurance will have to pay off claims for many of these disasters. Munich Re, a German insurer, estimates that global warming could cost \$300 billion annually by the year 2050 (Cortese, 2002a). Disclosure of cost information will require the insurance companies to estimate losses from agricultural damage, flooding, drought, and other environmental impacts.

Earlier studies concerning environmental disclosures show that disclosures vary among firms from different countries. Buhr and Freedman (2001) report that Canadian firms provide more extensive environmental disclosure than U.S. firms, whereas Guthrie and Parker (1990) find that U.S. firms are associated with greater environmental disclosures compared to Australian or U.K. firms. Gamble, Hsu, Jackson, and Tollerson (1996) also find that U.S. firms provide more extensive environmental disclosures compared to firms from 27 other nations. They also report that firms using the Anglo-American model (U.S., UK, Canada, and Australia) tend to provide more environmental disclosures compared to firms from other countries. Fekrat, Carla Inclan, and Petroni (1996), who examined firms from 18 nations, find that Canadian firms tend to provide the most environmental disclosures and Japanese firms the least, and they attribute this difference to the strength of capital markets. Williams (1999), examined disclosures by firms from seven Pacific nations, and finds that the key variables in determining environmental disclosures relate to cultural variables of uncertainty avoidance and masculinity, as defined by Hofstede (1980).² He finds, however, that the equity market is not a significant determining factor.

Most of these studies are based on the environmental information disclosed in the annual reports from 1980s to the mid-1990s. Environmental information is now also available from special environmental reports and company websites and these sources have not been utilized many earlier studies. According to corporateregister.com, an on-line website tracking social reporting, 339 separate environmental reports were issued in the U.S.A. in 1999 (Cortese, 2002b). Furthermore, the existing studies are based on data that were disclosed before the Protocol was signed. A number of major initiatives have recently been undertaken to encourage firms to provide environmental disclosures and environmental reports. These initiatives include the Global Reporting Initiative, SustainAbility, and CERES. This study utilizes environmental data disclosed in the financial statements, as well as in the environmental reports, and on websites.

2.2. Rationale for pollution disclosures

A number of theories have been developed to explain differential environmental disclosures by firms. Two of these theories—stakeholder theory and legitimacy theory—provide a more convincing rationale for environmental pollution disclosures (for example, see Gray, Kouhy, & Lavers, 1995). The stakeholder theory (Clarkson, 1995; Roberts, 1992;

² Masculinity vs. femininity and strong vs. weak uncertainty avoidance are two of the four original societal values that Hofstede (1980) described in his pioneering work on global culture. Masculinity refers to a society where male characteristics like assertiveness and heroism are valued more than female characteristics like caring and relationships. Uncertainty avoidance basically concerns the ability to deal with risk.

Ullmann, 1985) posits that environmental disclosures are made in response to the stakeholders' demand for environmental (and social) information. Management responds to public pressure by stakeholders by voluntarily disclosing the types of environmental (or social) information they demand. A major problem with this theory, however, is that it fails to explain why firms from similar industries operating in the same geographic areas provide differential disclosures.

According to legitimacy theory (Dowling & Pfeffer, 1975), social disclosure is a means to deal with the firm's exposure to political and social pressures (Lindblom, 1994; Patten, 2000). Firms behave in a way that is considered to be congruent with the society's perceived goals. By disclosing environmental information, firms attempt to convey to their stakeholders that they are meeting the society's environmental and social goals (even if they are not doing it), and thereby alleviate public pressures. Thus, the firms "legitimize" their performance by providing environmental (and social) disclosures (Lindblom, 1994).

Legitimacy theory has been examined in numerous empirical studies and the results of these studies have been fairly consistent in confirming the theory. Most of the studies utilize samples based on U.S. firms (see Patten, 1991, 1992; Walden & Schwartz, 1997). However, one study examined firms from Western European countries (Adams, Hill, & Roberts, 1998), and two other studies focused on Australian firms (Deegan & Gordon, 1996; Deegan & Rankin, 1996). Results of all these studies are consistent with legitimacy theory. Based on the findings of studies on legitimacy theory, we argue that disclosure of information on greenhouse gases fits the legitimacy model because managers of firms from the Protocol ratifying countries appear to perceive that detailed disclosures would be important for their public image. On the other hand, there is not likely to be strong pressure on firms from countries that have not signed the Protocol to make detailed pollution disclosures.

3. Hypotheses

3.1. *Disclosure index and firms from countries ratifying protocol*

The largest firms in the world, in general, are multinationals and most of them have manufacturing facilities and offices in several countries, including countries that have ratified the Protocol. Therefore, it can be argued that irrespective of whether or not the country of their home office has ratified the Protocol, these firms need to seriously consider the Protocol's implications for their future performance, especially with regard to their operations in the countries ratifying the Protocol. Because large expenditures may be required to meet the Protocol's requirements, it is important that these firms provide detailed disclosures on their efforts and achievements in reducing greenhouse gas emissions to assist investors in assessing the trade off between risk and return. For example, if a U.S.-based firm has manufacturing facilities in an E.U. country, it will need to make sure that the E.U.-based facility follows the E.U. requirements developed under the Protocol. It would, therefore, be important for this firm to disclose information on its efforts and success in meeting the regulatory requirement, including information on its future plans and projected costs of complying with regulations.

On the other hand, it can be argued that foreign multinationals operating in Protocol ratifying countries may not have strong motivation to make detailed disclosures because such disclosures are not required by the country of their home office. In this study, we

empirically test whether disclosures about greenhouse gases made by firms from Protocol ratifying countries differ from those made by firms that have their home offices in countries not ratifying the Protocol. We expect firms from countries that have ratified Kyoto to be associated with higher degrees of disclosures because they are likely to disclose more than the minimum requirement. We develop the following hypothesis to test this assumption.

H1. Firms from countries that have ratified the Kyoto Protocol make more detailed pollution disclosures pertaining to global warming compared to firms from countries that have not ratified the Kyoto Protocol.

3.2. Firm size and disclosure index

Environmental accounting literature argues that firm size plays an important role in a firm's pollution-abatement performance and pollution-emission disclosures (see, Spicer, 1978; and Roberts, 1992). This argument is based on the premise that larger firms could more easily afford the expenditures needed to abate pollution. Moreover, according to the political hypothesis (Watts & Zimmerman, 1986) larger firms attract greater attention from the media, policy makers, and regulators. They would be, therefore, under greater pressure to act in a manner consistent with the Protocol than smaller firms.

However, Patten (2000) shows that firm size may not be a critical factor in pollution performance and pollution disclosures. Despite Patten's study, we argue that this fear for incurring a high political cost provides the motivation for large firms to make detailed disclosures so that their pollution performance would not be underestimated or ignored by policy makers and regulators. The following hypothesis asserts the existence of a positive association between pollution disclosures and firm size.

H2. There is a positive association between firm size and global warming related pollution disclosures.

3.3. Debt/equity structure effect on pollution disclosures

According to the debt-covenant hypothesis in (Watts & Zimmerman, 1986), managers of firms with a high debt–equity ratio are expected to choose accounting policies and methods that would help them avoid debt-covenants' violations. The findings of several studies support this expectation (e.g., DeFond & Jambalvo, 1994; Jaggi & Lee, 2002; Sweeney, 1994). Consistent with this hypothesis, it is argued that firms with high debt–equity ratios are likely to opt for an accounting policy of detailed disclosures in order to keep their investors and creditors fully informed about their operating performance, including pollution performance. In the absence of detailed pollution disclosures, investors and creditors would not be able to properly evaluate the firm's risk of default, and thus they may avoid investing in the firm. Thus, we expect firms with a high debt–equity ratio to be more forthcoming and maintain a comparatively higher level of disclosures, including disclosures on global warming-related pollution emissions. We test this expectation using the following hypothesis:

H3. Firms with a higher debt–equity ratio have more extensive pollution disclosures concerning global warming than firms with a low debt–equity ratio.

3.4. *Return on assets and pollution disclosures*

It has been argued in the literature that firms with a better operating performance, proxied by the return on assets, are likely to have a higher incentive to make more detailed environmental disclosures (Roberts, 1992) because they can afford to spend more on environmental abatement. Similarly, Porter and van der Linde (1995) posit that firms that do a good job environmentally can be expected to perform better economically. While these studies posit different causality, it is our interest to test the association, and not make a causal inference. We test this expectation with the following hypothesis:

H4. There is a positive association between pollution disclosures and return on assets.

4. Research design

4.1. *Sample and study period*

We are focusing our study on large firms for the following reasons. We expect larger firms that are required to report to regulatory agencies to be more concerned with disclosures, including pollution disclosures. Larger firms are more likely to have a website that provides corporate financial and environmental information and these sites are a source of data for this study. Therefore, our study focuses on the largest firms in the industries affected by the Protocol in the Protocol ratifying countries compared with firms from non-ratifying countries.

The selection of large global firms starts with their identification from publicly available data bases, i.e., *Fortune's* list of 500 global companies and *Hoover's* directory. The 2002 edition of *Fortune's* list of 500 includes firms with revenues of at least U.S. \$10 billion. We select the firms that are classified in the chemical, oil and gas, energy, motor vehicles, and casualty insurers industries. To expand this sample, we include firms from the same industries found in Hoover's directory, which have revenues greater than \$6 billion.

The selected firms are screened on the basis of the following criteria. First, the firms must have a website in English to facilitate obtaining all necessary available data. Second, the firms must have operations in a country that has ratified the Kyoto Protocol. Third, a complete set of financial statements must be available. Firms not meeting any of these three criteria are excluded from the sample.³ The final sample consists of 120 firms from 20 countries. The number of firms at different steps of the selection process is provided in Table 1 and the names of firms from different countries are provided in Appendix A.

We examined the websites in May/June 2003 and obtained the latest information they contained on pollution disclosures related to global warming.⁴ Although the websites might not have been updated for some time, we assume that they were up to date, at least as far as early 2003. Any information on global warming available on the website was considered public information, and, we included it, if it is relevant to this study. In

³ The one exception is with Hyundai, which has no production facilities in countries that ratified Kyoto, but does sell cars that produce greenhouse gases in these countries.

⁴ We used a May–June 2003 window for the website to keep changes in the websites to a minimum and still be able to capture data through 2002.

Table 1
Sample selection

	Motor vehicles	Oil and gas	Energy	Chemicals	Insurance	Total
<i>Panel A: no. of firms operating in countries that ratified Kyoto Protocol^a</i>						
From Fortune 500	21	38	30	14	17	120
From Hoover's database	3	7	15	6	4	35
Total	24	45	45	20	21	155
Less:						
Website under construction		–2				–2
Website not in English		–1			–1	–2
Website unavailable	–1	–5	–2	–2	–1	–11
No operation in country that ratified Kyoto Protocol		–2	–11	–1	–1	–15
Incomplete financial data	–1	–2	–1	–1		–5
Final Sample	22	33	31	16	18	120
<i>Panel B: no. of firms disclosing information of carbon dioxide emissions</i>						
Country						
US	1	2	8	3		14
Japan	4		5	2	1	12
EU	4	6	7	4	3	24
Non-EU Europe					1	1
Canada		1	1			2
Australia		1				1
Total	9	10	21	9	5	54

^a These firms are from countries that ratified the Kyoto Protocol and they also include multinational firms belonging to countries which have not ratified the Protocol but have production facilities in countries ratifying the Protocol, with the exception of one firm from South Korea.

addition to the websites, we also collected relevant information from environmental reports, environmental statements, and annual reports. The annual reports made available to shareholders and the 10 K forms filed with the Securities and Exchange Commission and available on the SEC website were especially used for U.S. firms.

We used the latest available information, although some of these reports contained information pertaining to earlier years. Because emission information after 2000 was not available for several firms, we decided to use the emission disclosures for the year 2000 in order to increase number of firms in the analyses.⁵

4.2. Measurement of dependent variables: disclosure index

We develop a disclosure index using the content-analysis technique that focuses on the substance of what is disclosed rather than counting the lines of disclosure. This approach has been utilized in numerous earlier environmental-accounting studies (e.g., Freedman & Wasley, 1990; Wiseman, 1982). The disclosure indices, based on the categorical technique used in earlier environmental studies, either relate to environmental disclosures in general

⁵ Carbon dioxide emission data usually was presented for a number of years. In order to maximize the sample size, provide the most current data, and still be consistent in comparing companies we used emissions for the year 2000.

(Wiseman, 1982) or to disclosures concerned with a specific regulation (Patten, 2000) as is the case with this study.

Based on the requirements and expected consequences of the Protocol as well as on the existing literature dealing with perceived shareholders' environmental needs (e.g., Freedman, Jaggi, & Stagliano, 2004) and on the availability of information in 10 websites, we identified relevant categories for constructing a Protocol-related disclosure index for this study. Since our focus is on specific regulations, the number of disclosure categories is limited. We decided to use the following five categories that are expected to capture the Protocol-related disclosures:

1. Mention of global warming or of the Kyoto Protocol.
2. Firm's plans to deal with global warming and the objective to control global warming.
3. Potential costs to achieve the global-warming objectives.
4. Current costs to reduce the greenhouse-gas emissions.
5. Information on the extent of greenhouse-gas emissions.

Two disclosure indexes are developed based on two weighting schemes: equal weights and differential weights (unequal weights). The Equal Weight Index assigns a one to each item with a maximum score of five.⁶ This method is simple and avoids controversies.

Justification for using the Unequal Weighted Index is the assumption that the information conveyed by different items differ in importance. For example, a mere mention of global warming in the reports is not likely to provide adequate information to investors in evaluating the firm's performance and is not likely to be as informative as the cost information. Thus, there is a compelling argument for using differential weights for individual items, depending on the perceived importance of each item. There are, however, no guidelines on the weighting scheme to be used and we use the weights based on our perception of their contribution to the evaluation of the firm's global-warming performance. We give higher weight to quantitative information compared to descriptive information. Thus, the following weight scheme is developed:

<i>Item</i>	<i>Weight</i>
Mention global warming	1
Firm's plans	2
Potential costs	3
Current costs	3
Amount of emissions	3

The maximum score of the Unequal Weight Disclosure Index for a firm is 12. In order to overcome the weaknesses of the choice of weights in the Unequal Weight Disclosure Index, we use both Equal and Unequal Weight indices. Consistent results for both of these indices is an indication of the robustness of the evidence.

⁶ The weighting scheme utilized in this study just recognizes that the last three items provide more specific information than the first two. Although an argument can be made that each of the last three items should be weighed differentially, we find it hard to defend specific differences in those weights.

4.3. Selection of independent and control variables

We use four-test variables to test the hypotheses developed in the study. The first test variable is an indicator variable of KYOTO_DUM. It differentiates between the firms that belong to the groups of Protocol ratifying and non-ratifying countries. The variable is coded as one if the firm belongs to the Protocol ratifying country, otherwise zero. The second test variable is firm size (SIZE). We use the log of total assets for 2002 for this size variable. The third test variable is return on assets (ROA), and the fourth test variable is the debt-to-equity (DE) ratio. (Although long-term debt is sometimes used in the numerator, we use an overall measure of debt burden because it is considered to be more pertinent to pollution disclosures.)

In addition to these noted, independent variables, we use control variables for the different industry groups (IND_DUM), the Legal System of the country (LS_DUM), and an index of the regulatory enforcement level in the country (REL). These control variables should capture the impact of factors other than the test variables discussed above on pollution disclosures. The following industries are captured by the IND_DUM variables: auto, oil, energy, and chemicals. We use the legal system of the country as a variable because disclosures are significantly influenced by the country's legal system (e.g., Ball, Kothari, & Ashoket, 2000). Consistent with the literature, we classify countries into common and code law countries (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997). The LS_DUM is coded as one for common law countries, otherwise zero. In addition, we use the index of regulatory enforcement, as developed by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (unpublished working paper). This variable controls for the effectiveness of regulatory requirements.

4.4. Statistical tests and model

We use the following regression model to test the above hypotheses:

$$\begin{aligned} \text{POL_DIS}_{\text{DI}} = & \alpha + \beta_1(\text{KYOTO_DUM}) + \beta_2(\text{SIZE}) + \beta_3(\text{ROA}) + \beta_4(\text{DE}) \\ & + \beta_5(\text{LS_DUM}) + \beta_6(\text{REL}) + \beta_{7-10} \sum_{j=1}^5 \text{IND_DUM}_j + \varepsilon \end{aligned} \quad (1)$$

where:

POL_DIS_{DI}=Disclosure Index, where subscript DI=1 and 2, (1 represents Unweighted Disclosure Index and 2 represents Weighted Disclosure Index),

KYOTO_DUM=1 when the firm belongs to a country that ratified the Kyoto Protocol, otherwise 0

SIZE=Log of Total Assets

ROA=Return of Assets, proxy for operating performance

DE=Debt-Equity Ratio

LS_DUM=1 when from common-law country, otherwise 0

REL=Regulatory enforcement level

IND_DUM=Auto, oil, energy, chemical industry and insurance

α = Constant β_{1-10} = Coefficients ε = Residual

5. Results

5.1. Descriptive statistics

Descriptive statistics for disclosure indices and other variables are provided in Table 2.

Out of 120 firms, 68 firms belong to countries that ratified the Protocol (Kyoto firms) and 52 to countries that have not (non-Kyoto firms).

The mean of the equally weighted disclosure index for Kyoto firms is 2.35 against 1.21 for non-Kyoto firms. The mean for weighted index for Kyoto firms is 4.69 against 2.21 for non-Kyoto firms (Table 2, Panel A). We conduct a *t*-test to evaluate the significance of differences between the disclosure scores of Kyoto firms and non-Protocol firms. The *t*-test results indicate that the differences are statistically significant both for the equally weight index and the unequally weighted index at the level of 0.001%. These results clearly indicate that firms from countries that

Table 2
Descriptive statistics

Variable	Mean	Median	Maximum	Minimum	Standard deviation
<i>Panel A: firms from countries which ratified Kyoto Protocol (N= 68)</i>					
Disclosure index (equal weights)	2.35	3.00	4.00	0	1.23
Disclosure index (unequal weights)	4.69	6.00	9.00	0	2.67
Assets (in \$billions)	75.76	32.25	988.4	1.00	16.89
Return of assets	0.03	0.02	.18	−0.06	0.04
Debt/equity ratio	6.78	0.73	255.9	.73	32.06
<i>Panel B: firms from countries which have not ratified Kyoto Protocol (N= 52)</i>					
Disclosure index (equal weights)	1.21	1.00	3.00	0	1.30
Disclosure index (unequal weights)	2.21	1.00	6.00	0	2.49
Assets	58.71	21.00	561.00	1.20	103.41
Return of assets	−0.13	0.01	.21	−6.70	
Debt/equity ratio	.87	.85	−49.00	29.02	8.19
<i>Panel C: correlation among variables for the total sample</i>					
	EW	UEW	ROA	DE	Assets
Kyoto	0.415***	0.431***	0.133	0.118	0.059
EW		0.981***	0.008	−0.095	0.009
UEW			0.036	−0.081	−0.028
ROA				0.010	0.034
DE					−0.044

Where Kyoto=1 when the firm belongs to the country ratifying the Protocol, EW=equal weighted disclosure index, UEW=unequal weighted disclosure index, ROA=return on assets, DE=debt/equity ratio, Assets=total assets.

ratified the Kyoto Protocol provide more disclosures compared to firms from non-ratifying countries.

In Panel B of Table 2, we provide a correlation matrix for the total sample. The results show that the disclosure indices (equally weighted as well as unequally) are significantly correlated with the Kyoto variable, which is equal to one for the Kyoto firms and zero for non-Kyoto firm. There is no significant correlation among other variables.

5.2. Regression results

The regression results are provided in Table 3.

The regression results show a significant positive association (at the 0.01 level) between disclosure indices and the indicator variable for Kyoto and non-Kyoto firms. There is no difference in the results for the equally weighted and unequally weighted disclosures indices, suggesting that irrespective of the disclosure index used, the Kyoto firms provide more disclosure. These regression results are consistent with the *t*-test and correlation results. These results support H1, that firms from countries that ratified the Protocol provide greater pollution disclosures.

The regression results also show that the coefficient for firm size is positive and significant at the 0.01 level. This is interesting because the sample is already made up of

Table 3
Regression results on pollution disclosures for the total sample

Variables	Equal weight index model		Unequal weight index model	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
Intercept	−1.79	−3.89*	−1.43	−3.54*
KYOTO_DUM	0.22	3.52*	0.21	3.94*
SIZE	0.07	3.97*	0.06	3.51*
ROA	−0.02	−0.68	−0.01	−0.33
DE	−0.002	−1.77	−0.001	−1.67
LS_DUM	0.02	0.31	0.04	0.68
REL	0.006	0.36	0.005	0.36
AUTO	0.31	3.94*	0.25	3.67*
OIL	0.25	3.41*	0.20	3.09*
POWER	0.35	4.93*	0.30	4.84*
CHEM	0.26	3.01*	0.22	2.88**
<i>N</i>	120		120	
<i>F</i> -Value	6.50*		6.43*	
Adj. <i>R</i> -Square	0.32		0.31	

KYOTO_DUM=1 when the firm belongs to a country that ratified Kyoto Protocol, Otherwise 0. SIZE=log of total assets. ROA=return of assets, proxy for operating performance, DE=debt equity ratio, LS_DUM=1 if the country is a common law country, otherwise 0. REL=regulatory enforcement level, AUTO=1 when the firm belongs to the auto industry, otherwise 0. OIL=1 when the firm belongs to the oil industry, otherwise 0. POWER=1 when the firm belongs to the energy industry, otherwise 0. CHEM=1 when the firm belongs to the chemical industry, otherwise 0.

* Significant at 0.01 level.

** Significant at 0.05 level.

the largest companies in the world, yet firm size plays a significant role in determining the extent of pollution information disclosed. This finding supports H2 that the larger the firm, the higher the extent of pollution disclosures.

The coefficients on ROA and DE are statistically insignificant, suggesting that the operating performance, proxied by ROA, and the debt–equity ratio do not play a significant role in pollution disclosures; that is, H3 and H4 are not supported.

The coefficients for all industry groups included in the regression model (four industry dummies) are positive and statistically significant at the 0.01 level. This result suggests that all industry groups that are potentially severely impacted by the Kyoto Protocol provide relatively greater pollution disclosures.

5.3. Results on the impact of carbon dioxide emissions on disclosures

The Protocol especially focuses on carbon dioxide emissions. We, therefore, conduct additional analyses on firms that are associated with disclosure of information on carbon dioxide emissions. Only 54 sample firms provided that information. The breakdown of this sub-sample by industry and region is provided in Panel B of Table 1.

We conducted a regression analysis to determine whether carbon dioxide emissions (CO_2) would have an impact on the pollution disclosures made by Kyoto firms. In order to examine this, we include an interaction variable between CO_2 and KYOTO, where Kyoto is coded as one for Kyoto firms and zero for non-Kyoto firms. The coefficient of the interaction term will jointly test the association of pollution disclosures with CO_2 and whether the firms belong to Protocol ratifying or non-ratifying countries. The following regression model is used to evaluate this association:

$$\begin{aligned} \text{POL} - \text{DIS} = & \gamma + \delta_1(\text{KYOTO} * \text{CO}_2) + \delta_2(\text{SIZE}) + \delta_3(\text{ROA}) + \delta_4(\text{DE}) \\ & + \delta_5 + \sum_{j=1}^5 \text{IND_DUM}_j + \zeta \end{aligned} \quad (2)$$

where:

$\text{CO}_2 * \text{Kyoto}$ = interaction of the log of carbon dioxide emissions with the Kyoto dummy variable (Kyoto is coded as 1 for countries ratifying the Protocol).

$\delta_1 - \delta_9$ = coefficients,

ζ = residual

Other variables have been defined earlier.

The regression results are presented in Table 4.

The results indicate that the coefficients on the interaction variable, is positive and statistically significant. This finding thus suggests that the firms from countries ratifying the Protocol provide more pollution disclosures when carbon dioxide emissions are high. The results with regard to the firm size, ROA, and debt/equity are insignificant. In terms

Table 4

Regression results on disclosures for firms that disclosed carbon dioxide emissions data

Variables	Equal weight index		Unequal weight index	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
Intercept	0.79	1.26	0.82	1.60
KYOTO*CO ₂	0.01	2.07*	0.01	2.55**
SIZE	−0.02	−0.71	−0.02	−1.02
ROA	−0.88	−1.54	−0.76	−1.62
DE	0.01	0.48	0.002	0.17
LS_DUM				
REL				
AUTO	0.19	2.42**	0.17	2.57**
OIL	0.24	2.83**	0.18	2.56**
POWER	0.19	2.68**	0.16	2.68**
CHEM	0.13	1.53	0.11	1.65
<i>N</i>	54		54	
<i>F</i> -Value Prob	0.05		0.03	
Adj. <i>R</i> -Square	0.15		0.17	

KYOTO*CO₂=Interaction between Kyoto and CO₂, where Kyoto=1 when the firm belongs to a country that ratified the Kyoto Protocol, otherwise 0; and CO₂=log of carbon dioxide emissions. SIZE=log of total assets. ROA=return of assets, proxy for operating performance. DE=debt–equity ratio. LS_DUM=1 if the country is a common-law country, otherwise 0. REL=regulatory enforcement level. AUTO=1 when the firm belongs to the auto industry, otherwise 0. OIL=1 when the firm belongs to the oil industry, otherwise 0. POWER=1 when the firm belongs to the energy industry, otherwise 0. CHEM=1 when the firm belongs to the chemical industry, otherwise 0.

* Significant at the 0.05 level.

** Significant at the 0.001 level.

of disclosure by industry, the results indicate that three out of four industry groups have statistically significant coefficients at the 0.05 level, and the coefficient for the chemical industry is insignificant at the conventional level. It would appear that in the case of the chemical industry, disclosure of carbon dioxide emissions is independent of Kyoto adoption. We also conducted a test without the variables of firm size, ROA, and debt/equity and the results do not change.

6. Conclusion

The findings show that firms from countries that have ratified the Protocol provide greater pollution disclosures as compared to firms whose home countries have not ratified the Protocol even though they are firms operating in Protocol countries. Similarly, we find that firms from Protocol countries are more forthcoming about the firm's pollution performance, especially related to the Kyoto requirements. Even though firms from non-ratifying countries are required to meet the Protocol's requirements if they operate in Protocol ratifying countries, we find that they do not disclose equally detailed information on their pollution performance voluntarily.

An analysis of disclosures also indicates that only some Japanese firms disclosed current costs of reducing greenhouse gases, but no Japanese firm disclosed information on estimated future costs. In the absence of cost information, even the most sophisticated

users of financial statements are not likely to have a proper understanding of the impact of global warming on the firm's performance. In order to improve pollution disclosures for investment decisions, lack of voluntarism may lead regulators to consider mandatory disclosure requirements.

Appendix A. Names of firms from different countries by industry

Country not ratifying Kyoto Protocol	Countries that ratified Kyoto Protocol		Country that either ratified(R) or did not ratify (N) Kyoto Protocol		
U.S.	Japan	EU Countries	Europe (other than EU Countries)	Asia, (other than Japan) and Australia	North and South America, other than USA
<i>Panel A—motor vehicles</i>					
GM	Toyota	Daimler Chrysler		Hyundai (N)	
Ford	Honda	Volkswagen			
Dana	Mitsubishi	Renault			
Navistar Int'l	Fuji Hvy	BMW			
	Eqpt				
Paccar	Denso	Man			
	Mazda	Volvo			
	Nissan	Robert Bosch			
	Isuzu				
	Yamaha				
<i>Panel B—oil and gas</i>					
Amerada Hess	Showa Shell	ENI	Lukoil (N)	India Oil (R)	Imperial (R)
Chevron Tex.	Cosmo Oil	Statoil	Yukos (N)	SK (N)	Petrobas (N)
Conoco	Japan Engy	Anglo-Amer			
E O G Res.	Nippon-Mits			BHP Billiton(N)- Australian	
ExxonMobil	Idemitsu	Royal Dutch Shell			
Marathon		BP			
Occidental		Total Fina			
Phillips Pet.		EON			
Valero Pet.					
El Paso Engy					
Andarko Pet.					
Plains All					
AMCC					
Unocal					

(continued on next page)

Appendix A (continued)

Country not ratifying Kyoto Protocol	Countries that ratified Kyoto Protocol		Country that either ratified(R) or did not ratify (N) Kyoto Protocol		
	Japan	EU Countries	Europe (other than EU Countries)	Asia, (other than Japan) and Australia	North and South America, other than USA
<i>Panel C—energy</i>					
AEP	Tokyo Elec	Enel		Korean El. (N)	TransCanada (R)
Duke Engy	Kansai Elec	Endesa			
Reliant Engy	Chubu Elec	Gaz de France			
Aquila	Tohoku Elec	Scottish Power			
Mirant	Kyushu Elec	Iberdola			
Xcel Engy	Tomen	National Grid Gp.			
CMS Engy		RWE			
Cinergy		Suez			
Edison Int'l					
AES					
Con Ed.					
Public Serv Ent.					
Sempra Engy					
FirstEnergy					
KeySpan					
Dynergy					
<i>Panel D—chemicals</i>					
Dow	Marubeni	Aventis			
DuPont	Mitsubishi Ch	BASF			
Pharmacia	Sumitomo	Bayer Akzo Ch Imperial Ch Norsk Hydro Henkel MG Tech DSM Solvay			
<i>Panel E—Insurance</i>					
AIG	Tokyo Mne and Fire	Allianz AG	Zurich Ins (N)		
State Farm	Mitui Sumitomo	Munich RE	Swiss Reins (N)		

Appendix A (continued)

Country not ratifying Kyoto Protocol	Countries that ratified Kyoto Protocol		Country that either ratified(R) or did not ratify (N) Kyoto Protocol		
U.S.	Japan	EU Countries	Europe (other than EU Countries)	Asia. (other than Japan) and Australia	North and South America, other than USA
<i>Panel E—Insurance</i>					
All State	Yasuda Fire and Mne	Royal and Sun CGN			
Liberty Mutual					
Berkshire Htwy		Skandia			
CAN					
St Paul					
Chubb					

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The effect of mandatory auditor assignment and non-audit service on audit fees: Evidence from Korea[☆]

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Abstract

In Korea, regulators could assign auditors to firms. We investigate the relationship among audit fees, mandatory auditor assignment, and the joint provision of non-audit and auditor services in Korea. We find that assigned auditors charge significantly higher audit fees than freely selected auditors. We also find that the joint provision of non-audit and audit services does intensify the relation between auditor assignment and audit fees. Combined with the results of other studies that have shown that firms audited by assigned auditors report smaller amounts of discretionary accruals than firms audited by freely selected auditors, our results suggest the possibility that mandatory auditor assignment may improve auditor independence.

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Keywords: Audit fee; Auditor assignment; Joint provision of non-audit and audit services

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1. Introduction

This study investigates the relationship among audit fees, mandatory auditor assignment, and the joint provision of non-audit and audit services in Korea. Specifically, we examine how audit fees are affected by mandatory auditor assignment and the joint provision of non-audit and audit services. In 1989, regulatory bodies in Korea partially adopted an auditor assignment system to improve auditor independence. Under a mandatory auditor assignment system, companies are not allowed to select auditors for themselves. Instead, regulators mandatorily assign auditors to a company. Once an auditor is assigned, regulators expect the company and the audit firm to complete the audit engagement, unless there are legitimate reasons for not doing so. This assignment process gives auditors more power and could lead to higher audit fees than when companies select their own auditors on a competitive basis.³

Beck, Frecka, and Solomon (1988) and Deberg, Kaplan, and Pany (1991) argue that there may be a conflict of interest for auditors when they provide non-audit services as well as audit services. Investors and regulatory bodies have also raised concerns that the joint provision of non-audit and audit service may impair audit independence since auditors may be less likely to point out their own errors in the audit process if they also provide non-audit service in the design of the internal control system. During the 1990s in the USA, fees from non-audit services grew explosively, overtaking audit fees late in the 1990s (Ashbaugh, LaFond, & Mayhew, 2003). Levitt (2000) argues that the substantial growth in consulting services audit firms provided to their audit clients potentially compromised their independence. He also argues that auditors whose firms provide both audit and consulting services to the client tend to allow such clients to adopt borderline revenue enhancing accounting treatments more readily than when the auditor provides only audit services. Further, a series of accounting scandals including Enron, WorldCom, and others has prompted concerns about the joint provision of audit and non-audit services across the world. In a series of actions to address the concerns, the United States Congress enacted the Sarbanes–Oxley Act of 2002, which prohibits auditors from also providing most non-audit services to their audit clients.

Non-audit fees for Korean accounting firms have also grown rapidly and many Big Five accounting firms earn more from non-audit services than from audit services. Because of the profitability of non-audit services, audit firms may be prone to discount (lowball) the audit fees in the hope of securing additional, more profitable, non-audit service agreements. This suggests that the anticipated increase in audit fees from mandatory auditor assignment may be partly negated due to the joint provision of audit and non-audit services. In response, the Korean government began in 2001 requiring firms to disclose audit fees and non-audit fees in the footnote to financial statements and has prohibited auditors from providing certain non-audit services to

³ Before 1998, the fees that an audit firm could charge to its clients were heavily regulated by audit fee guidelines imposed by the Korean government (Taylor, Simon, & Burton, 1999). However, the audit fee guidelines were repealed in 1998. From that time on, audit fees are determined by negotiation between an auditor and its clients. Our sample period covers from 1999 to 2002.

audit clients consistent with action in the United States of America. This regulatory change in Korea creates a unique opportunity for examining the effect of auditor assignment and the joint provision of audit and non-audit services on audit fees.

Using the 2025 firm-year observations listed on the Korean Stock Exchange, we find that mandatory auditor assignment is associated with higher audit fees. We also document that this relation is not affected by the joint provision of audit and non-audit services. Rather, the joint provision of audit and non-audit services intensifies the auditor-assignment effect on audit fees.

This paper provides new evidence to two areas in auditing: First, it provides evidence on the effect of auditor assignment on audit fees. Most previous studies that examine the effect of auditor assignment on audit fees use discretionary accruals. This study documents that audit fees are higher when the auditor/client relationship is assigned by regulators, which may imply that in this setting clients have less bargaining power. Combined with the results of previous studies on the effect of mandatory auditor assignment on discretionary accruals, the results of this study suggest the possibility that mandatory auditor assignment may improve auditor independence. Second it adds additional evidence to the effect of the joint provision of non-audit services on audit fees. We also find that the joint provision of audit and non-audit services in Korea does not affect the auditor-assignment effect. These results may have implications for other countries that are interested in increasing auditor independence.

The remainder of the paper is as follows. The next section presents the auditor-assignment system in Korea, a review of previous research on the effect of the joint provision of audit and non-audit services, and our hypotheses. The research design and sample selection are discussed in Section 3. Descriptive statistics and the results of the empirical analysis are presented in Section 4. The conclusion of the paper is provided in Section 5.

2. Mandatory auditor assignment, provision of non-audit services, and hypothesis

2.1. Mandatory auditor assignment in Korea

During the late 1970s and early 1980s the rapid growth of the Korean economy spurred expansion of the Korean stock market. To meet the demand for credible financial reporting and external auditing required by this expansion, regulatory authorities in Korea enacted the Act on External Audits (hereafter “AEA”) in 1980. The AEA required that financial statements of companies with total assets larger than a certain amount be audited by external auditors. This requirement has substantially increased the number of companies subject to statutory external audits. At the same time, the AEA changed the auditor-selection mechanism from assignment to competition. Before the enactment of the AEA, auditors were assigned to firms by regulatory bodies. Under the new auditor-selection method, companies were free to select their own auditors and negotiate audit fees. This change in auditor selection by the AEA intensified competition among auditors and provided managers with the means to influence the auditor’s opinion through the threat of a potential change in auditor. Han (1998) reported that the proportion of firms

with other than unqualified opinion decreased to less than 5% in 1995 from 35% in 1981 among the listed firms in the Korean Stock Exchange, while the explanatory power of earnings for yearly returns decreased to 13.4% in 1995 from 38.4% in 1981. Taylor et al. (1999) provide evidence that the large audit firm fee premium does not exist in Korea. This may be due to the high level of competition among auditors and price-cap regulation in Korea.

However, investors' concerns over the lack of auditor independence increased significantly during the 1980s. As a result, the Financial Supervisory Service (the Korean counterpart of the SEC in the United States, "FSS" hereafter) recommended the revision of the AEA to increase auditor independence and address the investors' concerns about the quality of financial statements. AEA was amended in 1989 to introduce the mandatory auditor-assignment system for some firms, while maintaining competition, in general, among auditors. Under the new amended rule, the FSS assigns external auditors to firms that are likely to manipulate earnings or shop for opinions. The goal of this assignment is to increase auditor independence. The AEA specifically stipulates the conditions under which the FSS assigns auditors to firms: (1) when firms do not select auditors within the statutory auditor-selection period, (2) when firms change their auditor for inappropriate reasons, (3) when the FSS finds a violation of GAAP in the previous year's financial statements, (4) when a firms' owner-manager has more than 50% ownership, (5) when firms have a high debt-equity ratio, or (6) when the company's stock becomes an administrative issue in the Korean Stock Exchange or KOSDAQ due to bankruptcy, lack of liquidity, or bad governance structure, etc. In practice, the primary reasons cited for auditor assignment include an excessive debt-equity ratio, high owner-manager ownership, and administrative issues.

In Korea, listed companies are obliged to engage a given auditor for three consecutive years. Therefore, once auditors are assigned by the FSS, they will audit the company for three years without the burden of renegotiating a contract. If a company continues to require auditor assignment after three years the regulations specify that a new auditor is to be assigned. Therefore, under the mandatory-assignment system, there is a mandatory audit rotation and auditors would be interested in maximizing their revenues by charging higher audit fees, because clients could not change them.

When the FSS assigns auditors to companies, they generally choose auditors with a high assignment score. High scores are given to those auditors who are less often "detected" by the FSS review process of their external audits; auditors who audit their clients' financial statements in complete compliance with generally accepted auditing standards (GAAS), will not be "detected" for any wrong doings during the FSS review process. Therefore, the auditor-assignment process may encourage auditors to perform audits in strict compliance with GAAS. Compliance with GAAS during audits may imply higher quality audits and, therefore, higher costs.

Earlier studies suggest the possibility of attaining higher audit quality by mandatorily assigning auditors. Park (1996) and Kim, Min, and Yi (2002) provide evidence that companies with assigned auditors report smaller amounts of discretionary accruals than companies with competitively selected auditors. This result is interpreted to mean that assigned auditors more stringently restrict managers from adopting aggressive accounting methods compared to competitively selected auditors.

Also, assigned auditors have more bargaining power than competitively selected audit firms when negotiating audit fees, because assigned audit firms have a quasi-monopoly on the company's audit services. Accordingly, we expect fees for assigned auditors to be higher than the fees of competitively selected auditors, as stated formally in H1:

H1. Mandatorily assigned auditors charge higher audit fees than freely selected auditors.

2.2. Provision of non-audit service, auditor independence, and audit fee

Since the SEC in the USA first expressed concerns about the effect of the scope of auditor services on auditor independence in 1957, the provision of non-audit services has been a source of controversy because of the potential influence of non-audit services on auditor independence. DeAngelo (1981b) suggests that the auditor's dependence on a given client increases as the economic bond between the audit firm and the client increases. Simunic (1984) and Beck et al. (1988) argue that non-audit fees further increase the client–auditor bond by increasing the portion of the audit firm's wealth derived from serving a client. This bond could lead investors to perceive that auditor independence is impaired because (1) the audit team is unwilling to criticize the work performed by its consulting division, and (2) the audit firm does not want to lose profitable consulting services provided to the audit client and is, therefore, more reluctant to disagree with management's interpretations of accounting matters (Beck et al., 1988; Deberg et al., 1991; Pany & Reckers, 1983). That is, the economic bond between auditor and client, created by the provision of non-audit services may provide auditors with incentives to allow a manager's aggressive accounting treatment.

The 2001 Public Oversight Board annual report indicates that the level of non-audit services have grown so large that the size of the fees from these services raises investors' concerns about the auditor's independence or appearance thereof. Ashbaugh et al. (2003) show that average non-audit fees for Big 5 auditors is larger than the average audit fees (\$1,332,408 vs. \$546,420). More conservatively, Frankel, Johnson, and Nelson (2002) report that non-audit fees are, on average 49% of the total fees that auditors earn (including non-Big 5 auditors). This shift in audit firm revenue sources induced the U.S. SEC to issue a ruling on auditor independence in November 2000. The new rule requires companies to disclose, in their proxy statements, information about audit and non-audit fees billed by the audit firm. The disclosures are intended to provide information useful to investors in evaluating whether non-audit fees have impaired the auditor's independence.

Previous studies on the effect of the joint provision of audit and non-audit services on auditor independence have been inconclusive. While some researchers such as Simunic (1984), Palmrose (1986), and Ashbaugh et al. (2003) provide evidence that non-audit services have no effect on auditor independence, other studies such as Parkash and Venable (1993), Firth (1997), and Frankel et al. (2002) document that the joint provision of non-audit services by auditors may impair auditor independence or the appearance of auditor independence.

Parkash and Venable (1993) examine the relationship between non-audit services provided by auditors and various measures or predictors of agency costs, using U.S. data from 1978 to 1980. They find that the relative level of consulting fees to audit fees is

positively related to management shareholdings and the largest institutional shareholdings, and negatively related to debt-to-asset ratios. Firth (1997) also shows that firms with high agency costs are less likely to purchase non-audit services from their auditors. Frankel et al. (2002) find a positive association between abnormal accruals and the ratio of non-audit fees to the sum of audit fees and non-audit fees. This evidence is consistent with the idea that perceptions of auditor independence are even more important when agency costs are potentially high and that consulting services provided by the auditor may impair the appearance of independence. Therefore, it would be informative to examine whether the joint provision of audit and non-audit services are affected by mandatory auditor assignment; the joint provision of audit and non-audit services may have the opposite effect on the relationship between auditors and clients than intended by mandatory auditor assignment. For example, if mandatory assigned auditors are allowed to provide non-audit services, they may not charge higher audit fees. Thus, the joint provision of non-audit services may reduce auditor independence, which is opposite of the implied impact of auditor assignment. Whether mandatory assigned auditors charge higher audit fees will be an empirical question as tested in H2:

H2. Mandatory assigned auditors do not charge high audit fees when they provide audit and nonaudit services.

3. Research design and sample selection

3.1. Sample and data

To test our hypotheses we gathered data on firms listed on the Korean Stock Exchange over the period 1999 to 2002 from publicly available sources. Korean firms have reported audit fee and non-audit fee data for the most recent three years in the footnotes of financial statements since 2001. We extracted other financial statement items from the Korea Investors Service-Financial Analysis System (KIS-FAS) database, which provides the financial statements of Korean listed firms beginning with 1980. We use only December year-end firms for convenience (more than 80% of Korean firms use December year-end). We exclude from the sample, financial institutions that might have different determinants of audit fees (Stein, Simmons, & OKeefe, 1994). We collected both the audit opinion and auditor type (Big 5, non-Big 5) from the auditor's reports.

As shown in Table 1, the sample is spread over several industries. Approximately 42% of the sample companies are from chemical, rubber, plastic, and non-metallic manufacturing and 24% are from machinery and equipment manufacturing.

3.2. Research design

Simunic (1984) suggests that audit fees are affected by client size, audit complexity, and auditor–client risk sharing. Numerous empirical studies have adopted this model with the use of slightly different variables. These studies generally show that the model has good explanatory power and is robust across different samples, different time periods, and

Table 1
Distribution of sample used in this study by year and industry

Industry	All	1999	2000	2001	2002
Agriculture and fishing	15	4	4	3	4
Mining	284	68	70	68	78
Chemical, rubber, plastic, and non-metallic products	851	204	207	205	235
Machinery and equipment, electric machine manufacturing	480	118	119	118	124
Construction, electric, gas and sanitary services	222	53	53	51	65
Wholesale and retail trade, hotel and restaurants	145	33	36	34	42
Services	30	7	7	7	9
Total	2025	487	496	486	557

different countries. The variables we use are client size, debt ratio, audit opinion, auditor type, and the proportion of inventories and receivables among total assets.⁴

DeAngelo (1981a) argues that the existence of client-specific quasi-rents to incumbent auditors lead to low-balling in the initial audit period. Consistent with her argument, Simon and Francis (1988) and Ettredge and Greenberg (1990) provide empirical evidence that substantial price-cutting actually occurs in the first year of the audit. Therefore, we include an indicator variable for the initial audit in the regression. We expect a negative coefficient on this variable.

Previous studies indicate that the large international accounting firms systematically charge higher audit fees. For example, Simon and Francis (1988) estimate a Big 8 premium of approximately 18% across a number of studies and Craswell, Fancis, and Taylor (1995) estimate 28–39% brand name premium in their study. While Taylor et al. (1999) find no audit-fee premium for the large accounting firms in Korea during 1995–1996; we include the size variable in this study. This leads to the following regression model.

The following regression:

$$\text{Audit Fee}_{it} = a + b_1 \text{Initial}_{it} + b_2 \text{Design}_{it} + b_3 \text{Opinion}_{it} + b_4 \text{Auditor}_{it} \\ + b_5 \text{InvRec}_{it} + b_6 \text{Size}_{it} + b_7 \text{Leverage}_{it} + b_8 \text{Non-audit}_{it} + e_{it} \quad (1)$$

where:

- Audit Fee_{it} is the log transformed audit fee for firm i at year t .
- Initial_{it} indicates a new auditor during year t , otherwise zero.
- Design_{it} indicates an assigned auditor during year t , otherwise zero.
- Opinion_{it} indicates other than unqualified opinion in year t , otherwise zero.
- Auditor_{it} indicates an auditor in year t is Big 5, otherwise zero.
- InvRec_{it} is the sum of inventory and receivables divided by total assets for firm i at year t .
- Size_{it} is the log transformed total assets for firm i at year t .
- Leverage_{it} is total liabilities divided by total assets for firm i at year t .
- Non-audit_{it} is the log transformed non-audit fee for firm i during year t and e_{it} is the error term.

⁴ We do not use the number of consolidated subsidiaries and the proportion of subsidiaries that represent foreign operations because this information was unavailable for our sample firms.

4. Descriptive statistics and empirical results

4.1. Descriptive statistics

Panel A of Table 2 provides descriptive statistics regarding the fee variables used in the audit–fee model. The data show that mean audit fee and non-audit fees paid by clients in our sample are 70 MM Korean won and 26 MM Korean won, respectively. We recalculate the mean of non-audit fees paid by clients, because 495 firms purchased non-audit services from incumbent auditors. The mean of non-audit fees paid by firms that purchase both audit and non-audit services from the incumbent auditors is 106 MM Korean won, which is close to the mean audit fees paid by those firms, 112 MM Korean won. The mean audit-fee ratio calculated by dividing non-audit fees by the sum of audit and non-audit fees is 6.5%, which is relatively small. But the standard deviation of the audit-fee ratio is large (16%), which implies large variation among firms.

Panel B of Table 2 shows differences in the model variables across different engagements in which the auditor provided or did not provide non-audit services in conjunction with audit services. As shown in the panel B of Table 2, firms that purchase

Table 2
Descriptive statistics ($N=2025$) (unit: MM in Korean Won)

Panel A.					
	Mean	Std dev	Median	Min	Max
Audit fee	69.9	77.6	46	4	1212
Non-audit	25.9	172.1	0	0	4007
Ratio	6.5%	15.7%	0%	0%	96.7%
Audit fee to size	0.04%	0.04%	0.02%	0.0%	0.9%

Panel B. Differences between firms with audit fees and firms with audit fee and non-audit fees ($N=2025$)			
	Firms without non-audit service	Firms with non-audit services	<i>t</i> -value
Audit fee	56.2 (43.0)	111.9 (65.0)	−9.51* ¹
Audit fee to size	0.04% (0.03%)	0.02% (0.02%)	5.48* ¹
InvRec	0.282 (0.266)	0.265 (0.250)	2.28* ²
Size	542,146 (156,882)	2,106,215 (320,730)	−12.1* ¹
Leverage	0.64 (0.53)	0.63 (0.59)	0.56
Initial	313 (20.5%)	83 (16.8%)	
Designated	184 (12.0%)	36 (7.2%)	
Opinion	74 (4.8%)	17 (3.4%)	
Auditor type	1005 (65.7%)	381 (76.7%)	

*Ratio is calculated by dividing non-audit fees by the sum of audit and non-audit fees.

*¹ Significant at 1% level; *² is significant at 5%.

The number in parenthesis is the median.

Table 3
Correlation matrix among variables using the whole sample

	Initial	Design	Opinion	Auditor	InvRec	Size	Leverage	Non-audit fee
Fee	−0.098* ¹	−0.030	0.004	0.284* ¹	−0.247* ¹	0.833* ¹	−0.011	0.479* ¹
Initial		0.284* ¹	0.067* ¹	−0.082* ¹	−0.016	−0.049* ²	0.060* ¹	−0.041* ³
Design			0.169* ¹	−0.121* ¹	−0.008	−0.085* ¹	0.174* ¹	−0.065* ¹
Opinion				−0.001	−0.061* ¹	−0.038* ¹	0.279* ¹	−0.013
Auditor					−0.074* ¹	0.251* ¹	−0.047* ²	0.147* ¹
InvRec						−0.307* ¹	−0.051* ²	−0.120* ¹
Size							−0.071* ¹	0.445* ¹
Leverage								−0.002

1. Variable definition: Audit Fee_{it} is the log transformed audit fee for firm *i* at year *t*; Initial_{it} is 1 when firm *i* is audited by a new auditor during year *t*, otherwise 0; Design_{it} is 1 when firm *i* has an assigned auditor during year *t*, otherwise 0; Opinion_{it} is 1 when audit opinion for firm *i* at year *t* is not unqualified, otherwise 0; Auditor_{it} is 1 when an auditor for firm *i* at year *t* is Big 5, otherwise 0; InvRec_{it} is calculated by dividing the sum of inventory and accounts receivable by total assets for firm *i* at year *t*; Size_{it} is log transformed total assets for firm *i* at year *t*; Leverage_{it} is calculated by dividing total liabilities by total assets for firm *i* at year *t*; Non-audit fee_{it} is the log transformed non-audit fee firm *i* at year *t*.

2. *¹ is significant at 1%; *² is significant at 5%; *³ is significant at 10%.

audit and non-audit services from the same vendor pay higher audit fees and are larger than firms that purchase only audit services. Also, firms that purchase both audit and non-audit services are more likely to be audited by Big 5 auditors. However, firms that purchase only audit services pay relatively high audit fees relative to size and have more initial and designated auditors than firms that purchase audit and nonaudit services.

Table 3 reports the correlation matrix among variables used in the analysis. Audit fees are significantly and positively correlated with auditor type, client size, and non-audit fees, while they are significantly and negatively correlated with initial audit, the portion of inventory, and receivables out of total assets. Although the auditor-assignment variable is negatively correlated with audit fees, the coefficient is not significant. However, before we draw any conclusion, we should estimate multivariate regressions.

4.2. The effect of mandatory auditor assignment on audit fees⁵

Table 4 reports the results of the audit-fee model described in Section 3 excluding the non-audit-fee variables. The model is significant at $p < 0.01$ with an adjusted *R*-squared of 71.0% which is comparable to the results of other studies using U.S. and Australian data (Felix et al., 2001; Craswell et al., 1995; Francis & Simon 1987, among others). The coefficients on several control variables such as the initial audit dummy, auditor type, size of clients, and leverage are significant and have the expected signs. Consistent with the argument of DeAngelo (1981a) and the results of many empirical studies, such as Francis and Simon (1987) and Ettredge and Greenberg (1990), the initial audit-indicator variable is negative and significant. This implies that auditors in Korea also

⁵ We also estimated the regressions with industry and year dummy variables and using only Big 5 clients. The results are qualitatively similar to the results of the regressions without these variables.

Table 4

Regression coefficients of the following equation:

$$\text{Audit Fee}_{it} = a + b_1 \text{Initial}_{it} + b_2 \text{Design}_{it} + b_3 \text{Opinion}_{it} + b_4 \text{Auditor}_{it} + b_5 \text{InvRec}_{it} + b_6 \text{Size}_{it} + b_7 \text{Leverage}_{it} + e_{it}$$

Variables	(1)	1999	2000	2001	2002
Initial	-0.122 (-6.27)* ¹	-0.064 (-2.06)* ²	-0.109 (-2.44)* ²	-0.081 (-1.79)* ³	-0.173 (-4.80)* ¹
Design	0.130 (4.85)* ¹	0.047 (1.09)	0.069 (1.22)	0.270 (4.92)* ¹	0.142 (2.60)* ¹
Opinion	0.034 (0.85)	-0.036 (-0.52)	0.066 (1.02)	-0.010 (-0.13)	0.182 (1.80)* ³
Auditor	0.116 (6.58)* ¹	0.086 (2.68)* ¹	0.131 (4.00)* ¹	0.140 (4.31)* ¹	0.126 (3.67)* ¹
InvRec	0.068 (1.14)	-0.045 (-0.40)	0.072 (0.67)	0.114 (1.03)	0.117 (1.10)
Size	0.378 (63.2)* ¹	0.378 (34.26)* ¹	0.393 (35.32)* ¹	0.388 (34.96)* ¹	0.363 (30.78)* ¹
Leverage	0.029 (3.36)* ¹	0.033 (1.63)	0.016 (1.20)	0.050 (4.01)* ¹	0.162 (3.70)* ¹
N	2025	487	496	486	556
R ²	71.0%	75.5%	75.7%	75.6%	69.1%

1. Variable definition: Audit Fee_{it} is the log transformed audit fee for firm i at year t; Initial_{it} is 1 when firm i is audited by a new auditor during year t, otherwise 0; Design_{it} is 1 when firm i has an assigned auditor during year t, otherwise 0; Opinion_{it} is 1 when the audit opinion for firm i at year t is not unqualified, otherwise 0; Auditor_{it} is 1 when an auditor for firm i at year t is Big 5, otherwise 0; InvRec_{it} is calculated by dividing the sum of inventory and accounts receivable by total assets for firm i at year t; Size_{it} is the log transformed total assets for firm i at year t; Leverage_{it} is calculated by dividing total liabilities by total assets for firm i at year t.

2. *¹ is significant at 1%; *² is significant at 5%; *³ is significant at 10%.

3. Numbers in parentheses are *t*-values.

discount audit fees during the first year of the relationship as in other countries. In contrast to the Taylor et al. (1999) study, the coefficient on the auditor-type variable is positive and significant at $p < 0.01$. The coefficients on the size and leverage variables are also positive and significant at $p < 0.01$.

We are interested in the auditor-assignment variable (Design). Consistent with H1, the coefficient on this variable is significant and positive. This implies that mandatorily assigned auditors charge higher audit fees, conditional on other variables including firm size.⁶

We re-estimate regression (1) by year to determine whether the results differ over the sample period. The last four columns of Table 4 show the coefficients of the regression for each year. The model remains significant at $p < 0.01$ for each year and the adjusted *R*-squared values are 75.5%, 75.7%, 75.6%, and 69.1% for 1999, 2000, 2001, and 2002, respectively. While the results are slightly weaker across years than in the pooled regression, overall results are qualitatively similar to those in the pooled regression. The initial audit, auditor type, client size variables show significant coefficients, consistent with those in the pooled

⁶ Because several independent variables are significantly correlated, as shown in Table 3, we calculate the variance inflation factor for each independent variable to investigate the severity of multicollinearity among independent variables. None of the variance inflation factor is greater than two implying that multicollinearity among independent variables is not severe enough to change the results.

Table 5

Regression coefficients of the following equation:

$$\text{Audit Fee}_{it} = a + b_1 \text{Initial}_{it} + b_2 \text{Design}_{it} + b_3 \text{Opinion}_{it} + b_4 \text{Auditor}_{it} + b_5 \text{InvRec}_{it} + b_6 \text{Size}_{it} + b_7 \text{Leverage}_{it} + b_8 \text{Non-Audit}_{it} + e_{it}$$

	Pooled	1999	2000	2001	2002
Initial	−0.120 (−6.35)* ¹	−0.055 (−1.79)* ³	−0.106 (−2.41)* ²	−0.094 (−2.10)* ²	−0.183 (−5.24)* ¹
Design	0.138 (5.25)* ¹	0.045 (1.06)	0.075 (1.34)	0.272 (5.01)* ¹	0.179 (3.37)* ¹
Opinion	0.034 (0.87)	−0.035 (−0.51)	0.075 (1.18)	−0.010 (−0.13)	0.158 (1.61)
Auditor	0.109 (6.36)* ¹	0.084 (2.63)* ¹	0.127 (3.96)* ¹	0.133 (4.14)* ¹	0.118 (3.54)* ¹
InvRec	0.055 (0.95)	−0.061 (−0.55)	0.036 (0.34)	0.120 (1.10)	0.132 (1.19)
Size	0.352 (54.8)* ¹	0.363 (30.5)* ¹	0.368 (29.0)* ¹	0.369 (30.5)* ¹	0.334 (26.9)* ¹
Leverage	0.026 (3.04)* ¹	0.031 (1.54)	0.013 (0.98)	0.047 (3.82)* ¹	0.149 (3.53)* ¹
Non-audit	0.056 (9.99)* ¹	0.038 (3.20)* ¹	0.045 (4.14)* ¹	0.037 (3.63)* ¹	0.063 (6.23)* ¹
N	2025	487	496	486	556
R ²	72.3%	76.0%	76.4%	76.2%	71.1%

1. Variable definition: Audit Fee_{it} is log transformed audit fee for firm *i* at year *t*; Initial_{it} is 1 when firm *i* is audited by a new auditor during year *t*, otherwise 0; Design_{it} is 1 when firm *i* has an assigned auditor during year *t*, otherwise 0; Opinion_{it} is 1 when audit opinion for firm *i* at year *t* is not unqualified, otherwise 0; Auditor_{it} is 1 when an auditor for firm *i* at year *t* is Big 5, otherwise 0; InvRec_{it} is calculated by dividing the sum of inventory and accounts receivable by total assets for firm *i* at year *t*; Size_{it} is log transformed total assets for firm *i* at year *t*; Leverage_{it} is calculated by dividing total liabilities by total assets for firm *i* at year *t*; Non-audit_{it} is the log transformed non-audit service fee for firm *i* during year *t*.

2. *¹ is significant at 1%; *² is significant at 5%; *³ is significant at 10%.

3. Numbers in parentheses are *t*-values.

regression for all four years. Also, the auditor-assignment and leverage variables show the same significant coefficients as those in the pooled regression for two years. None of the yearly regressions reverses the signs of the coefficients on the auditor-assignment variable. These results imply that either the mandatorily assigned auditors charge higher audit fees, or the freely selected auditors discount audit fees during the first year of a relation.

4.3. The effect of non-audit services on audit fees and mandatory the auditor-assignment effect

To investigate how the joint provision of audit and non-audit services influences the effect of mandatory auditor assignment on audit fees, we estimate Eq. (1) in Section 3, which includes non-audit-fee as an independent variable. Table 5 presents the regression estimation results. The overall model is significant at $p < 0.01$ with an adjusted *R*-squared of 72.3%, which is close to that of the audit-fee model without the non-audit-fee variable. Consistent with previous studies and the results in the previous section, the coefficient on the non-audit-fee variable is significant and positive, suggesting that non-audit services are

related to audit services. However, the inclusion of non-audit fees does not appear to add significantly to the explanatory power of the model.

In this regression, we are interested in the coefficient on the auditor-assignment variable that shows a significantly positive coefficient in regression (1) without non-audit fees. As shown in Table 5, the coefficient on the assigned-auditor variable is positive and significant at $p < 0.01$. The results for control variables are similar to those shown in the tests of H1. That is, the initial audit variable is significantly negative and auditor type, client size, and leverage variables are significantly positive. The results of yearly regressions are also qualitatively similar to those of the pooled regression. These results are consistent with the results reported in the previous section, indicating that the effect of mandatory auditor assignment on audit fees documented in the previous section does not change by including non-audit fees as an independent variable in the regression.

However, to investigate the statistical significance of the joint provision of audit and non-audit services on the mandatory auditor assignment and other control variables, we add interaction variables between non-audit services and auditor assignment, initial audit indicator, auditor type, client size, and leverage to the audit-fee model (1) after deleting non-audit fee variable. Specifically we run the following regression:

$$\begin{aligned} \text{Audit Fee}_{it} = & a + b_1 \text{Initial}_{it} + b_2 \text{Initial}_{it} * \text{Dummy}_{it} + b_3 \text{Design}_{it} \\ & + b_4 \text{Design}_{it} * \text{Dummy}_{it} + b_5 \text{Opinion}_{it} + b_6 \text{Auditor}_{it} \\ & + b_7 \text{Auditor}_{it} * \text{Dummy}_{it} + b_8 \text{InvRec}_{it} + b_9 \text{Size}_{it} \\ & + b_{10} \text{Size}_{it} * \text{Dummy}_{it} + b_{11} \text{Leverage}_{it} \\ & + b_{12} \text{Leverage}_{it} * \text{Dummy}_{it} + e_{it} \end{aligned} \quad (2)$$

where:

- Dummy_{it} is one when firm i purchases audit and non-audit services from incumbent auditor at year t , and
- Other variables are defined as in Eq. (1).

The coefficients b_2 , b_4 , b_7 , b_{10} , and b_{12} represent the effects of non-audit services on other determinants of audit fees: initial-audit, mandatory auditor-assignment, auditor-type, client-size and leverage variables, respectively. If the joint provision of audit and non-audit services affects the effect of auditor assignment on audit fees, the coefficient on b_4 will not be significant.

Table 6 presents the results of regression Eq. (2). The overall model is significant at $p < 0.01$ with an adjusted R -squared of 72.0%. The coefficient on the initial-auditor-indicator variable is significant and negative, and the coefficients on the assigned-auditor, auditor-type, client-size, and leverage variables are significant and positive as in two previous regressions. Also, the assigned auditor, auditor type, and size interaction variables show the significant positive coefficients. That is, mandatorily assigned Big 5 auditors charge significantly higher audit fees than other auditors when they jointly provide audit and non-audit services. This implies that the joint provision of audit and non-

Table 6

Regression coefficients of the following equation:

$$\text{Audit Fee}_{it} = a + b_1 \text{Initial}_{it} + b_2 \text{Initial}_{it} * \text{Dummy}_{it} + b_3 \text{Design}_{it} + b_4 \text{Design}_{it} * \text{Dummy}_{it} + b_5 \text{Opinion}_{it} + b_6 \text{Opinion}_{it} * \text{Auditor}_{it} + b_7 \text{InvRec}_{it} + b_8 \text{InvRec}_{it} * \text{Auditor}_{it} + b_9 \text{Size}_{it} + b_{10} \text{Size}_{it} * \text{Dummy}_{it} + b_{11} \text{Leverage}_{it} + b_{12} \text{Leverage}_{it} * \text{Dummy}_{it} + \epsilon_{it}$$

	Pooled	1999	2000	2001	2002
Initial	0.095 (4.42)* ¹	-0.072 (-2.15)* ²	0.074 (1.53)	0.050 (0.93)	-0.093 (-2.26)* ²
Initial * Dummy	0.101 (-2.16)* ²	0.112 (1.28)	0.099 (0.83)	-0.093 (-0.93)	-0.323 (-4.02)* ¹
Design	0.112 (3.89)* ¹	0.029 (0.64)	0.050 (0.83)	0.254 (4.20)* ¹	0.133 (2.26)* ²
Design * Dummy	0.199 (2.70)* ¹	0.188 (1.41)	0.307 (1.75)* ³	0.095 (0.70)	0.149 (1.05)
Opinion	0.063 (1.58)	-0.028 (-0.40)	0.094 (1.46)	0.047 (0.60)	0.175 (1.75)* ³
Auditor	0.081 (4.23)* ¹	0.065 (1.88)* ³	0.079 (2.21)* ²	0.098 (2.73)* ¹	0.116 (3.11)* ¹
Auditor * Dummy	0.161 (3.68)* ¹	0.153 (1.76)* ³	0.241 (0.1)* ¹	0.178 (2.26)* ²	0.005 (0.06)
InvRec	0.068 (1.16)	-0.044 (-0.40)	0.076 (0.71)	0.121 (1.10)	0.112 (0.99)
Size	0.364 (58.2)* ¹	0.370 (32.4)* ¹	0.383 (32.8)* ¹	0.378 (32.4)* ¹	0.342 (25.6)* ¹
Size * Dummy	0.006 (2.49)* ²	0.003 (0.47)	0.004 (0.74)	0.004 (0.89)	0.010 (1.83)* ³
Leverage	0.030 (3.50)* ¹	0.037 (1.82)* ³	0.016 (1.28)	0.051 (4.09)* ¹	0.143 (3.23)* ¹
Leverage * Dummy	-0.189 (-3.60)* ¹	-0.196 (-1.64)* ³	-0.263 (-2.32)* ²	0.188 (-2.60)* ¹	0.030 (0.19)
N	2025	487	496	486	556
R ²	72.0%	75.8%	76.5%	76.3%	70.6%

1. Variable definition: Audit Fee_{it} is the log transformed audit fee for firm i at year t; Initial_{it} is 1 when firm i is audited by a new auditor during year t, otherwise 0; Design_{it} is 1 when firm i has an assigned auditor during year t, otherwise 0; Opinion_{it} is 1 when audit opinion for firm i at year t is not unqualified, otherwise 0; Auditor_{it} is 1 when an auditor for firm i at year t is Big 5, otherwise 0; InvRec_{it} is calculated by dividing the sum of inventory and accounts receivable by total assets for firm i at year t; Size_{it} is the log transformed total assets for firm i at year t; Leverage_{it} is calculated by dividing total liabilities by total assets for firm i at year t; Non-audit_{it} is the log transformed non-audit service fee for firm i during year t; Dummy is 1 when firm i purchases non-audit services, otherwise 0.

2. *¹ is significant at 1%, *² is significant at 5%, *³ is significant at 10%.

3. Numbers in parentheses are t-values.

audit services does not weaken but rather intensifies the effect of mandatory auditor assignment on audit fees.

The coefficients on the initial audit indicator and the interaction variable between initial audit indicator and non-audit services are significantly negative. This suggests that both mandatorily assigned auditors and freely selected auditors discount audit fees for the first year of the contract when firms offer both audit and non-audit services. The coefficient on the leverage variable is significant and positive, suggesting that auditors charge higher audit fees for firms with high leverage due to the high audit risk. In contrast, the leverage dummy interaction variable shows a negatively significant coefficient. This suggests that auditors who also provide non-audit services may discount audit fees for clients with high leverage if there is a chance to provide non-audit services to these clients.

We also re-estimate regression Eq. (2) year-by-year and the last four columns of Table 6 report the results of the yearly estimation. As shown in Table 6, the results are qualitatively the same as in the pooled regression. However, the results become slightly weaker by showing that the coefficients on the auditor-assignment variable are significantly positive only for two years.⁷ The coefficients on the interaction variable between auditor assignment and the provision of non-audit services are also positive for all four years, but only two are significant. Although the results become generally weaker, the results of yearly regressions confirm the pooled-regression results that the joint provision of audit and non-audit services does not weaken but rather intensifies the effect of mandatory auditor assignment on audit fees. The results related to the initial audit in the yearly regression are also similar to those in the pooled regression. That is, the coefficients on the initial-audit indicator are always negative for four years, although significant for two years, only while the coefficients on the interaction variable between initial audit and the joint provision of audit and non-audit services are unstable, showing only one significant year. The coefficients on auditor type and the interaction variable are significant and positive for three years. The coefficients on the interaction variable between client size and the joint provision of audit and non-audit services are significant for only one year, suggesting that client size may not have a consistent effect on audit fees when the auditor also provides non-audit services. The results on leverage and the interaction variable between leverage and the provision of non-audit services in yearly regressions are also the same as those in the pooled regression.

Also, we re-estimate the regressions Eqs. (1) and (2) after coding the design variable to indicate if firm-year is the first, second, or third year of the mandatory assigned auditor to investigate whether start-up costs for assigned firms are driving the results. While the results generally become weaker, the results are qualitatively similar to the results in the previous section.⁸

Taken together, empirical test results show that mandatory auditor assignment is positively related to audit fees and this relation is not affected but rather intensified by the joint provision of audit and non-audit services.

⁷ We would have liked to perform other statistical tests to determine whether this result is a period-specific phenomenon by performing the Fama and MacBeth (1973) test or the bi-nomial test using yearly coefficients as observations. However, there are not sufficient data to perform such tests.

⁸ We are thankful to the reviewer who pointed out this issue. The results are not included in the paper, but available from authors on request.

5. Conclusion

The purpose of this paper is to examine (1) whether mandatory auditor assignment allows auditors to charge higher audit fees, and (2) whether the joint provision of audit and non-audit services affects the impact of auditor assignment on audit fees. Under a mandatory auditor-assignment system, auditors may charge higher audit fees due to their increased bargaining power. Our empirical results, based on a sample of 2025 firm years over a period from 1999 to 2002, are consistent with the idea that assigned auditors charge higher fees than competitively selected auditors and that the joint provision of audit and non-audit services does not alleviate the effect of auditor assignment on audit fees, even though the results are relatively weak. Further, we find that the joint provision of audit and non-audit services intensifies the effect of auditor assignment on audit fees. Our result raises the possibility that the auditor-assignment system may improve auditor independence and audit quality.

We do, however, find that non-audit fees are positively associated with audit fees. This could be the result of knowledge spillover or production efficiency for the joint provision of audit and non-audit services. This result may not be consistent with the notion that auditor independence is impaired by the provision of non-audit services. The generalized ability of whether the inference we make in this paper will require further studies, especially since the companies that have mandatory assigned auditors and purchase both audit and non-audit services make up a very small portion of the sample firms used in the study. Additionally, we do not control the amount of audit hours in our test. If assigned auditors simply spend more hours due to the audit risk of the assigned clients, we may not be able to infer that the higher audit fees charged by assigned auditors imply high quality audit. In addition, we cannot conclude based on the results of this paper whether assigning auditors to all firms would improve the overall quality of audit, because the very existence of the assignment system may hinder the development of audit skills unless there is an appropriate controlling (monitoring) mechanism for the quality of audit.

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Firm-specific determinants of continuous corporate disclosures

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Abstract

Continuous disclosure is the immediate release of material information by issuers within a regulatory and information dissemination framework. Under such a regime, the market is informed at all times and no investor is disadvantaged by lack of access to information. We attempt to identify the firm-specific determinants of these disclosures.

We examine the frequency and regularity of online announcements on the stock exchange websites of companies included in the Morgan Stanley Capital Index for small-cap firms in eight developed markets in Asia and Europe. We find that firms with higher information asymmetry have a higher frequency and regularity of continuous online reporting. Our results also show that the frequency and regularity of online disclosure is positively associated with agency costs, earnings, and analyst following and is inversely related to the length of the product cycle of a firm. Our results are more robust for discretionary disclosures. We also find variations in the frequency of disclosures by countries, some of which are explainable by the online disclosure settings of the countries.

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Keywords: Continuous corporate disclosure; Internet disclosure; Firm-specific determinant; On-line reporting

1. Introduction

In a continuous disclosure regime, corporations are required either by law or by the listing regulations of securities markets to inform the securities regulators or markets of

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material events whenever those material events occur. By contrast, in a periodic disclosure reporting regime, corporations are required to make more in-depth, periodic disclosures of firm performance. Continuous disclosure is central to the smooth functioning of securities markets (ASX, 2002; FSA, 2001, 2002; The Treasury, 2002). The proposal by the Securities and Exchange Commission to widen the scope of events that would trigger the filing of a form 8-K (SEC, 2002a,b) would move the United States closer to a continuous disclosure model.

Developments in information and communication technologies (ICT), notably the Internet, have been important for both the continuous and periodic disclosure models. The publication of periodic disclosures on the Internet in databases such as EDGAR (USA) or on corporate Websites have allowed low-cost and ubiquitous access to filings and disclosures (Benston, Bromwich, Litan, & Wagenhofer, 2003; Debrecceny, Gray, & Rahman, 2002; FASB, 2000; IASC, 1999). Developments in ICT significantly facilitate the continuous disclosure model. When material disclosures are made available at low cost in a timely fashion to all stakeholders, continuous disclosure is enhanced. Securities exchanges and securities regulators are rapidly adopting the Internet as a means of information dissemination (e.g., SEC, 2002a,b, 2003).

Continuous disclosure changes the pattern and frequency of disclosure. There is a burgeoning literature that studies the frequency of disclosure by corporations. Recent studies research quarterly reporting (Butler, Kraft, & Weiss, 2002; Chen, DeFord, & Park, 2002; Landsman & Maydew, 2002), conference calls (Brown, Hillegeist, & Lo, 2002; Bushee, Matsumoto, & Miller, 2002; Frankel, Johnson, & Skinner, 1999) and reporting of specific items of expanded disclosure such as segment reports (Botosan & Harris, 2000). This literature attempts to identify firm-specific reasons and effects of specific forms of frequent disclosures. However, it treats each disclosure as an independent event and stops short of recognizing the frequency of such disclosures.

We note two typical features of continuous disclosure. These are frequency and spread. Frequency accounts for the number of specific instances of disclosure and spread is the distribution of disclosure across time. Similar to other forms of disclosure (Healy & Palepu, 2001; Jensen & Meckling, 1976), online disclosures have both causes and effects. Causes are variables that determine the level or nature of voluntary disclosure (e.g., firm-specific reasons identified in Hossain, Perera, & Rahman, 1995). Effects are investor and market reactions to voluntary disclosure or changes to market parameters arising from voluntary disclosure (e.g., cost of capital identified in Botosan, 1997). In this paper, we focus on the causes of continuous disclosure and attempt to identify firm-specific determinants of frequency of continuous corporate disclosure. To achieve greater depth in our understanding, we further investigate the determinants by types of disclosure and by stock exchanges. An investigation by stock exchanges gives us insight into whether these disclosures are simply artifacts of regulatory arrangements or are indeed driven by firm and market variables.

Our source for continuous disclosure data is the Internet's continuous disclosure arrangements on stock exchange websites. Disclosures on this source are widely accessible by investors. We study the corporate announcements on stock exchange websites over a 15-month period for 334 corporations in eight countries. The companies chosen are those from the Morgan Stanley Capital Index (MSCI) for "small cap"

companies in developed markets. The companies are indicative of entities that are monitored by a range of market participants including mutual funds, insurance companies, and individual stockholders, but they are not so large as to warrant intensive analyst following that may make continuous disclosure regimes of less value (also see Botosan, 1997). The eight countries we have chosen (United Kingdom, France, Germany, Denmark, Norway, Finland, Singapore and Hong Kong) each has a continuous disclosure reporting regime that is available on its stock exchange website to all firms listed on the exchange and is also publicly accessible.

We conduct both long window (15 months) and short window (1 month) tests. The long window tests generally cover the frequency and type of disclosures in a full reporting cycle starting from last year's closing date to the current year's earnings announcement. We take a 15-month period to include all disclosures made for the year and made prior to the annual earnings announcement. The short window allows us to capture the spread or regularity of disclosure within the annual reporting cycle.

We find that frequency and regularity of online disclosure is positively associated with agency costs, earnings and analyst following and is inversely related to the length of a firm's product cycle. Our results are more applicable to discretionary forms of disclosure such as prospective information disclosure. We also find variations in the frequency of disclosures by countries, some of which are explainable by the online disclosure settings of the countries.

The rest of the paper is organized as follows. The second section introduces the currently evolving concept of continuous disclosure and relates this form of disclosure to the literature on frequency of disclosure. The third section provides an evaluation of the nature of continuous disclosures on the stock exchange websites. The fourth section identifies the key drivers of continuous disclosure. The fifth section discusses the findings. The final section provides conclusions for this study and raises questions for future research.

2. Background and literature review

2.1. Continuous disclosure

The primary idea behind continuous disclosure is to provide price-sensitive information to the market as soon as it is known to the issuer of securities (AIMR, 2000; SGX, 2003; The Treasury, 2002). The purpose of such disclosures is to create adequately informed markets. Frequent and timely disclosures are considered important parameters of the quality of disclosure (AIMR, 2000). Internet-linked venues provide low-cost means of disseminating market-relevant corporate information. They are also valuable for stakeholders as they provide for ease of access and low transaction cost of information search. Other benefits include near-instantaneous availability of information and fair disclosure to all interested parties, as all stakeholders can equally acquire the information, given the effectively ubiquitous reach of the Internet. Therefore, in theory, "continuous disclosure means that the market is informed at all times and that no investor is disadvantaged by lack of access to material information" (ASX, 2002, 3).

However, continuous disclosure brings a number of challenges. Without regulatory monitoring systems, it may be prone to premature release of information. A higher frequency of disclosure may unduly prejudice the proprietary interests of the disclosing firms — it is often difficult to balance the requirement to ensure that the market is made aware of market-relevant information with the need to maintain corporate competitive advantage. While corporate disclosure regimes are predicated on the need for corporations to disclose information that is material to the market, there is no clear definition at present of what constitutes materiality. Although material information is presumed to be price-sensitive information, a clear formulation to predict the price effect of information is yet to be discovered.

At a technical level, distribution of information on individual corporate websites may make effective institution of rules difficult as it may be challenging for regulators to monitor corporate disclosures on a host of individual websites, each with its own design nuances.¹ Further, while information is typically made available to stakeholders effectively in real-time, it may be difficult for market participants to monitor disclosures and to evaluate the relative importance of a host of disclosures.

A freely available source of continuous corporate disclosure in many countries is the stock exchange website. Online disclosures on stock exchange websites differ from periodic disclosure in that they are driven by events rather than periods of disclosure stipulated in disclosure regulations or company policies. In this respect, we consider the antecedents of periodic disclosures, i.e., end of a quarter, half-year or a year period, as an event. Periodic disclosures relating to and emanating from the end of a period would be part of the overall continuous disclosure process.

Although events may be regarded as the primary motivator for continuous disclosure, it is at the discretion of the managers to determine the materiality of such events and, thereby, make the necessary announcements. Therefore, similar to voluntary disclosures made in annual reports, the frequency with which continuous disclosures are made will depend on characteristics similar to those of voluntary disclosures in annual reports.

2.2. The key firm-specific drivers of continuous disclosures

Botosan and Harris (2000) argue that disclosure *frequency* is as important as disclosure *level*. Frequency of disclosure was the subject of early studies comparing the effectiveness of quarterly reporting and annual reporting (e.g., May, 1971). Botosan and Harris (2000) studied the determinants and effects of managers' decisions to increase segment-disclosure frequency. Butler et al. (2002) examined the determinants and effectiveness of quarterly earnings disclosure in comparison to seminal annual reporting. Landsman and Maydew (2002) used price and volume tests to examine the effects of quarterly earnings.

Lundholm and Myers (2002) demonstrate that higher levels of disclosure reduce information asymmetry and allow investors to predict future earnings better. Likewise, earlier studies, such as Botosan (1997), suggest that higher levels of disclosure reduce information asymmetry and thereby reduce cost of capital of firms. Botosan (1997)

¹ See CLERP 9, Chapter 8, for discussion of these issues.

demonstrates that firms would, therefore, increase disclosure to reduce information asymmetry. Specific to frequency of reporting, Butler et al. (2002) show that quarterly reporting, i.e., frequency of periodic reporting, is associated with information asymmetry. Brown et al. (2002) also find association between information asymmetry and conference-call disclosures. Because continuous disclosure is a near instantaneous method of informing the market, firms with high information asymmetry would disclose more frequently to avoid the consequences of such asymmetry. Therefore, we hypothesize that:

H1. Frequency of continuous disclosure is positively associated with a firm's level of information asymmetry.

Financial reporting is a means of mitigating agency problems (Healy & Palepu, 2001; Jensen & Meckling, 1976). Leftwich, Watts, and Zimmerman (1981) find that the debt ratios of semiannual reporters in the United States are significantly higher than the corresponding ratios for the other reporting frequencies and assets-in-place, a proxy for information asymmetry of semiannual reporters, was lower than that for other reporters. Butler et al. (2002) expected reporting frequency to vary with assets-in-place and capital structure. They argued that firms with a higher percentage of tangible assets have lower agency costs because it is more difficult for managers to misappropriate well-defined assets-in-place than to extract value from uncertain growth opportunities. Therefore, since these firms have lower agency costs, they can reduce their reliance on disclosures. They also consider that firms with more debt financing have higher agency costs and therefore exhibit a greater demand for monitoring. Similar to Leftwich et al. (1981), Butler et al. (2002) expect firms with more financial leverage to report more frequently. Likewise, we expect the frequency of on-line corporate disclosure to be higher for firms with variables that generate agency costs, e.g., assets-in-place and leverage. However, Williamson (1988) has argued that assets-in-place determines the capital structure. He explained that asset-in-place would lead to debt financing as it would lead to lower agency costs associated with debt. Furthermore, prior studies (see Hossain et al., 1995)² have found inconsistent results for leverage due to the varying compositions of debt and equity. We, therefore, use assets-in-place as our measure of agency costs. Accordingly, we hypothesize that:

H2. Frequency of continuous disclosure is negatively associated with a firm's extent of assets-in-place.

One cost of disclosure, and particularly disclosure of firm prospects, is the competitive damage that results when firms provide proprietary information to current and potential competitors (Butler et al., 2002). Competitive damage can arise more immediately if a firm

² Hossain et al. (1995) reviewed both U.S. and non-U.S. firms. In many non-U.S. markets, debts are mainly private in nature. Since private debts would normally have private disclosure arrangements and would not involve market transactions, firms having such debts would require less public disclosure. Therefore, debt equity is a logical determinant of public disclosure only if debt has a large public component. On the other hand, AIP is a broader determinant of public disclosure arising out of debt financing. Most private and public debt would require higher asset specificity (Williamson, 1988). We also ran tests with debt/equity ratio as a determinant. As expected for non-U.S. firms, we found weak support for this determinant.

discloses more frequently. According to Butler et al. (2002), proprietary costs vary by industry and are higher for firms in concentrated industries, which are generally less competitive and therefore more likely to protect economic rents by less frequent reporting. To measure proprietary costs, Butler et al. (2002) use the four-firm concentration ratio (CR4) defined as the sum of the market shares of the four largest firms in the industry. They expect a negative relation between the four-firm concentration ratio and reporting frequency. Likewise, we hypothesize that:

H3. Frequency of continuous disclosure is negatively associated with a firm's level of market concentration.

Dechow and Dichev (2001) argue that as a firm's production cycle lengthens, errors in accrual estimation grow. Shortening the reporting interval exacerbates these estimation errors and results in noisier financial reports. Based on this reasoning, firms with longer production cycles, measured as a function of days in inventory, will issue interim reports less frequently. However, Butler et al. (2002) argue that the demand for more frequent accounting disclosures is greater for firms with longer product cycles because such firms are less transparent. In addition, product cycle is an important measure of a firm's activity. Since it could be argued that a firm's continuous disclosure is driven by the occurrence of material events and not by the market and contracting motivations, we include product cycle in our model to control for occurrence of material events. Once again, product cycle can have two connotations. The first connotation is that firms with shorter product cycles would have more disclosures relating to the completion and sales of their products. The second connotation, running contrary to the first and similar to Butler et al.'s lack of transparency argument, would be that firms with longer product cycles would have to disclose more about their unfinished production activities to keep the market informed. Since we cannot infer a clear direction for the relation between frequency of disclosure and product cycle, we hypothesize that:

H4. Frequency of continuous disclosure is not associated with a firm's product cycle.

As discussed in Lang and Lundholm (1993), theory and empirical evidence on voluntary disclosure offer no clear-cut predictions on the relation between firm performance and levels of voluntary disclosure. Further, the relation between disclosure and performance may not be linear. For example, Skinner (1994) demonstrates that the level of disclosure increases with an increase in losses because in such situations firms try to reduce litigations from investors. Chen et al. (2002) also demonstrate that additional balance-sheet disclosures are more likely among firms reporting losses with larger forecast errors. Conversely, Miller (2002) shows that firms with increasing profits would increase discretionary disclosures. Most researchers agree that performance and disclosure are related. Butler et al. (2002) include four lagged measures of firm performance: (i) return on assets; (ii) return on equity; (iii) 12-month stock returns and (iv) 12-month market-adjusted stock returns. We also include performance measures to ascertain the influence of performance on frequency of online disclosure. However, since disclosure is related to both high profit and loss, and as this phenomenon is measurable by the absolute value of a firm's earnings, we posit a positive relation between frequency of continuous disclosure

and an absolute measure of performance. We select return on equity because it better reflects the relation between performance and stockholder equity. Therefore, we hypothesize that:

H5. Frequency of continuous disclosure is positively associated with a firm's absolute value of return on equity.

To ascertain whether or not the direction of earnings influence disclosure we include a dichotomous variable which is equal to one if the firm has made a profit and zero if it made a loss during the year. Because of the earlier expression of inconclusiveness in the relation between disclosure and performance, we do not posit a definite direction in the relation between the sign of performance and frequency of continuous disclosure. Therefore, we hypothesize that:

H6. Frequency of continuous disclosure is not associated with a firm's direction of performance.

Healy and Palepu (2001) argue that apart from corporations disclosing through regulated financial reports and voluntary communications, there are disclosures about firms by information intermediaries, such as financial analysts. Lang and Lundholm (1993) demonstrate that analyst following is positively influenced by the level of disclosure of a firm. However, Foster (1986), Nagar, Nanda, and Wysocki (2003) and Skinner (2003) argue that analysts are an important part of the demand mechanism of corporate disclosure. Yet another argument is that analyst reports and earnings announcements are competing forms of disclosure mechanisms and the market values both these forms of disclosure (Francis, Schipper, & Vincent, 2002). Recent studies such as Lang, Lins, and Miller (2002) seem not to make a distinction with respect to causality between disclosure and analyst recommendations; instead they simply regard analysts as information intermediaries who use corporate disclosures along with information from other sources to further inform the markets about corporate activities. Lang et al. (2002) demonstrate that analysts can mitigate the effects of poor corporate governance by functioning as additional monitoring devices. Since our study is about determinants of frequency of disclosure, we recognize the demand aspect of analysts and posit that analysts as a consumer and distributor of corporate information would call for greater corporate disclosure. Therefore, we hypothesize that:

H7. Frequency of continuous disclosure is positively associated with a firm's analyst following.

According to Lang et al. (2002) and Nagar et al. (2003), ownership structure also affects investor demand for disclosure. The higher the ownership spread the greater would be the agency problem. Furthermore, ownership of equity capital by large shareholder blocks, e.g., large family and institutional shareholdings, may have control rights through board membership (Shleifer & Vishny, 1997). Such ownership requires low public disclosure because they have direct private monitoring rights. Therefore, we posit that:

H8. Frequency of continuous disclosure is positively associated with a firm's ownership spread.

High growth prospects represent intangibles such as technology, corporate strategy, and human resources (Lev & Sougiannis, 1999). Firms with high growth prospects will have specific knowledge that is not effectively and efficiently transferable to investors through traditional accounting disclosures. Firms attempt to mitigate the information asymmetry of high-growth-prospect firms by making disclosures through additional means such as conference calls (Frankel et al., 1999). With the availability of online modes of disclosure, we expect firms to provide information about growth through the continuous disclosure format. Since high-growth firms are more risky (Lev & Sougiannis, 1999), they are likely to make disclosures more frequently. Therefore, we hypothesize that:

H9. Frequency of continuous disclosure is positively associated with a firm's growth prospect.

2.3. Industry and country control variables

Both Botosan (1997) and Nagar et al. (2003) contend that different disclosure levels could prevail in different industries due to their varying disclosure needs. These disclosures arise from differences in technologies, the nature of activities and the varying levels of risks and returns. Likewise, we posit that there will be variation in frequency of continuous disclosure between industry sectors. Therefore, we included relevant industry dummies to control for industry effects. However, initial tests suggested weak association between industry and frequency of disclosure. In our final test we include a dummy for financial services because financial service firms have separate disclosure rules specific to their industry.

According to Debreceeny et al. (2002), the U.S. has capital markets with higher levels of liquidity than the markets of other countries. At the same time, the U.S. has extensive disclosure regulations and enforcement arrangements that provide investors with a strong sense of security and certainty. Therefore, we expect the disclosure frequencies of U.S.-listed firms to be more than that of the firms that are not listed in the U.S. exchanges.

Continuous disclosure levels could also be affected by national and cultural factors. Although choice of identifying material and the manner in which it will be made available to the market is largely voluntary, the rules of securities agencies, stock exchanges listing requirements, and accounting standards of respective countries can influence the frequency of continuous disclosures. Bushman, Piotroski, and Smith (2003) provide evidence of the interplay of firm-level transparency and various national disclosure and governance features. A recent study by Standard and Poors on Transparency and Disclosure of firms from 23 countries suggests that disclosure levels in countries such as the United States is higher than that of emerging and less developed markets in Asia and Latin America (Standard & Poors, 2002). Likewise, we also expect to observe variations in the frequencies of disclosures by countries. In our examination of requirements for disclosure of material information we have found greater specificity in the requirements of Finland, Norway and Singapore to disclose and in the manner to disclose on stock exchange websites. In addition, the United Kingdom is considered to have higher levels of transparency (Bushman et al., 2003) which could also be observable in the levels of frequencies of UK firms' continuous disclosures. All countries covered in our study also

have explicit insider-transaction-disclosure requirements. Therefore, we expect to see higher proportions of share-transaction disclosures in the total disclosures of the firms in all our eight countries. Given that a mix of country-level regulatory and transparency influences can affect disclosures, we control for such influences by adding dichotomous (one, zero) country indicators in our multivariate analyses.

2.4. Model

Based on the above discussion, we model the relation between the frequency of online reporting and its determinants in the following manner:

$$\begin{aligned} \text{FREQ}_f = & \alpha + \beta_1(\text{ASYMMETRY}_f) + \beta_2(\text{AGENCY}_f) \\ & + \beta_3(\text{PROPRIETARY}_f) + \beta_4(\text{PRODUCT_CYCLE}_f) \\ & + \beta_5(\text{PERFORMANCE}_f) + \beta_6(\text{EARNFLAG}_f) \\ & + \beta_7(\text{ANALYST}_f) + \beta_8(\text{OWNERSHIP}_f) + \beta_9(\text{GROWTH}_f) \\ & + \beta_{10}(\text{FINSERV}_f) + \beta_{11}(\text{USLIST}) + \beta_{12}(\text{COUNTRY}_1) + \dots \\ & + \beta_{19}(\text{COUNTRY}_8) + \xi \end{aligned} \quad (1)$$

where,

FREQ_f=number of online disclosures.

ASYMMETRY_f=information asymmetry of a firm.

AGENCY_f=agency cost of a firm.

PROPRIETARY_f=proprietary cost within an industry.

PRODUCT CYCLE_f=the time taken for a product to be turned around from an input to its final sale.

PERFORMANCE_f=firm performance.

EARNFLAG_f=dichotomous dummy for firm profit (loss).

ANALYST_f=number of analyst forecasts of EPS.

OWNERSHIP_f=ownership spread or free float.

GROWTH_f=ratio of market value to average equity.

FINSERV_i=dichotomous dummy for industry class.³

USLIST_f=listing on NYSE or NASDAQ.

COUNTRY_{1–9}=dichotomous dummy for country.

Since frequency of continuous disclosure has no specified period, we test the above model for both a long window (in this case, disclosure over all 15 months) and a short

³ Our tests have shown that there is no systematic variation in disclosure between the firms within the non-financial SIC categories (i.e., a series of dummy variables for industry membership at the one digit SIC level were introduced into the long-window regressions and were not significant). We found that only financial firms have different levels of disclosure. Therefore, unlike previous disclosure studies we use a dummy identifying only two classes of industries, i.e., financial and non-financial.

window (in this case, disclosure in each of the 15 months). The long-window tests generally cover the frequency and type of disclosures in a full reporting cycle starting from last year's closing date to the current year's earnings announcement. We take a 15-month period to include all disclosures made for the year under examination and made prior to the annual-earnings announcement, i.e., until three months after the close of the year.⁴ The short-window tests allow us to capture the spread or regularity of disclosure within the annual-reporting cycle because they examine the data by very short durations. Since firms tend to disclose more around earnings announcements and other major events, the long window tests may be biased by these events. Short-window tests, based on monthly data, will be less biased by periodic or one-off events' disclosures than the annual tests.

3. Data

Announcements on the stock exchange websites are the primary sources of data of disclosure for the purposes of this study. We select our sample from the 59 stock exchanges that were members of the World Federation of Exchanges as at 1 January 2003. Twenty-one of these stock exchanges provided free and open access to announcements and had announcements in English.⁵ Eight of these 21 were chosen for this study. At the time of data collection for this study, all of the eight stock exchanges required prompt disclosure of material information after careful scrutiny. Material information in all cases was price-sensitive information. In all cases such information had to be disclosed to the stock exchange in the form of announcements. Regardless of varying electronic filing systems, all of the eight stock exchanges had websites for company announcements that were readily accessible by investors. Since all announcements were provided in English, the announcements could be regarded as understandable to a wide range of investors around the world.

The sample for this study comprised of 334 listed companies from Denmark, Finland, France, Germany, Hong Kong, Norway, Singapore, and United Kingdom included in the Morgan Stanley Capital Index (MSCI) Developed Markets Small Cap Index (US\$0.2–1.5b market capitalization). (See Table 2 for the breakdown by countries). The reasons for choosing this sample were as follows: (i) the sample is drawn from a selection of major stock exchanges in Europe and Asia that have arrangements for online posting of company

⁴ Initially, we took 15 months because the stock exchanges of our sample have preliminary announcement deadlines within three months or less after the close of the year. We also considered that firms have different year-ends. However, this was not a matter of serious concern as we examined associations, not causality. In spite of all these considerations, we finally kept the same time period for all firms to control for the impact of environmental variables such as major political and economic crises. Firms tend to make more disclosures in the period after major crises such as that which occurred on September 11, 2001.

⁵ The three stock exchanges in the U.S., (NYSE, NASDAQ and AMEX) have no arrangements for online disclosure of corporate announcements. This is perhaps because of the extensive corporate disclosure infrastructure existing outside the exchanges, via the SEC's EDGAR system and by voluntary disclosure mechanisms such as PRNewswire. Another major stock exchange, the Tokyo Stock Exchange, did not have online disclosure arrangements for corporate announcements.

announcements in English; (ii) the exchanges chosen are all from developed markets, ensuring that there is less market-based differences between the countries; (iii) the companies indexed by MSCI are listed companies that have, at least in part as a result of their inclusion on an established capital market index,⁶ an international following, and (iv) MSCI Small Cap companies are relatively small and are therefore expected to have low analyst coverage, obviating bias that would come from including larger companies that typically have more analyst coverage (Botosan, 1997).

Research assistants visited the websites of each of the exchanges and collected each announcement for the companies on the index. Each announcement was carefully coded against a detailed classification matrix. Data-collection procedures were instituted to ensure high levels of quality control and procedures put in place to ensure and then verify inter-rater reliability. Inter-rater reliability was primarily established through direct consultation by the data collectors with the researchers. Such consultations were extensive at the start of the project, which meant substantial time was invested in training the data collectors. The data collected were 12,673 separate announcements made over a period of 15 months between 1 January 2001 and 31 March 2002.

3.1. Variable measurement

FREQ_f Frequency of online disclosure in the reporting period is measured as the number of online disclosures made on the designated stock exchange website. Data were hand collected directly from the websites of the stock exchanges where the announcements are disclosed.

ASYMMETRY_f Landsman and Maydew (2002) and Cready and Hurtt (2002) narrow down the measures of information asymmetry to a measure of variation in abnormal returns and a measure of variation in trading volume during the study period. Following their two studies, information asymmetry was measured using two types of liquidity measures. One measure was price-based and the other was volume-based. For price-based measures we used the standard deviation of the monthly abnormal returns during the 15-month period of the long window (STD-AR-LW) and the standard deviation of abnormal returns of the immediate past four months for the monthly data of the short window (STD-AR-SW). The volume-based measures were the standard deviation of the ratio of monthly share turnover by total shares outstanding for the 15 months of the long window (STD-VOL-LW) and the standard deviation of the ratio of monthly share turnover by total shares outstanding for the immediate past four months for the monthly data of the short window (STD-VOL-SW). Past months were used in the monthly data tests to provide the variability needed to compute the standard deviation and also to take into account the immediate past asymmetry which may affect current disclosure decisions (Botosan & Harris, 2000; Butler et al., 2002).

⁶ The MSCI Developed Markets Small Cap Index was created in 1998 to provide a global performance index for all classes of small capitalization firms. It covers equities ranging in market capitalization from \$0.2b to \$1.5b. There is a total of 1722 securities from 22 countries in the Index, from Asia (448); Europe (494); North America (726) and Oceania (54). Our sample (334) covers 20% of the firms included in the index.

- AGENCY_f Tangible assets to total assets (assets-in-place (AIP) or asset specificity).
- PROPRIETARY_i Recent studies have measured proprietary cost within an industry using the industry-concentration ratio CR4, which is the percentage of total revenues of the four largest firms within an industry. These prior studies were mostly U.S.-based. In the U.S., there are generally many firms within an industry. Given that most of our stock exchanges were comparatively smaller than the US stock exchanges, some industries in some stock exchanges were found to have very few firms. Therefore, we compute industry concentration by dividing the total revenues in the industry, measured by the two-digit SIC, by the number of firms in that industry (PROPRTY).
- PRODUCT CYCLE_f Days of inventory (PRODUCT CYCLE).
- PERFORMANCE_f Absolute value of return on equity (ROE).
- EARNFLAG_f Dichotomous dummy for firm profitability. One=profit firm and Zero=loss firm (EARNFLAG).
- ANALYST_f Analyst coverage measured by the number of forecasts of EPS(ANALYST).
- OWNERSHIP_f Spread of ownership as determined by MSCI free float (FLOAT). MSCI defines the free float of a security as the proportion of shares outstanding that are deemed to be available for purchase in the public-equity markets by international investors. Limitations on free float available to international investors include: strategic and other shareholdings not considered part of publicly available shares and limits on share ownership for foreigners (MSCI 2001, 12).
- GROWTH_f Growth prospects (GROWTH), represented by market-to-book value (Myers, 1977; Ohlson, 1995).
- FINSERV_f Dichotomous dummy for industry class. 1= financial firm and 0=non-financial firm (FINSERV).
- USLIST_f Dichotomous dummy for listing on NYSE or NASDAQ. 1=listing and 0=no listing (USLIST).
- COUNTRY₁ ₈ Dichotomous dummy for country (FR, DE, DK, NO, FI, UK, SG and HK). Data for the independent variables were collected from the Global Vantage database.

The variable PRODUCT CYCLE is not applicable to financial services firms. For financial services firms, data for PRODUCT CYCLE were standardized using the sample mean. We use multiple measures for some of the independent tests to provide for robustness in our results. We chose from the literature both firm based variables and proxies. Where possible market-based variables and proxies were used because the firm-based variables and proxies could suffer from endogeneity as the dependent variable itself is firm-based.

4. The nature of continuous disclosures on stock exchange websites

The nature of information disclosed varies widely. Information ranged from straightforward announcements of changes in shareholding of significant shareholders and announcements of the filing of financial statements with regulators to in-depth analyses of firm prospects. Following an analysis of the content of the announcements, we classify the

Table 1
Frequency of disclosures by MSCI small cap firms in Paris, London, Helsinki, Oslo, German, Copenhagen, Singapore and Hong Kong stock exchanges between Jan 2001 and Mar 2002

	Singapore	Finland	France	Norway	Denmark	Germany	UK	Hong Kong	Total
<i>Panel A: number of announcements by disclosure types and countries</i>									
Shares	1010	538	418	720	9	112	3273	218	6285
Accounting and finance	187	180	207	457	27	423	1121	270	2896
Accounting	133	101	118	124	17	180	718	237	1636
Rpt-qtr	28	46	70	205	6	207	62	16	645
Dividend	9	3	2	35	0	6	228	5	298
Profit warning	6	15	7	46	0	18	86	3	182
Finance	11	15	10	47	4	12	27	9	135
Prospective:	193	223	126	301	13	227	854	145	2075
Products	104	136	82	172	11	160	456	29	1148
Mergers	83	76	36	108	2	58	320	114	794
Future prospects	6	11	8	21	0	9	78	2	133
Personnel:	110	116	8	195	8	66	440	138	1082
Board change	66	70	1	147	7	29	162	92	577
Coy meeting	35	27	4	25	1	27	255	46	419
Other personnel	9	19	3	23	0	10	23	0	86
Other	14	10	5	131	3	12	66	46	335
Total	1514	1067	764	1804	60	840	5754	817	12673
Number of companies	22	20	54	16	13	46	120	42	334
Disclosures per company	68.82	53.35	14.15	112.75	4.62	18.26	47.95	19.45	37.94
<i>Panel B: proportion (%) of disclosure by types of disclosures</i>									
Shares	66.73	50.41	54.68	39.91	15.00	13.33	56.88	26.66	49.60
Accounting and finance	12.63	16.90	27.15	25.32	45.50	50.28	19.49	33.07	22.86
Accounting	9.05	9.50	15.41	6.90	28.83	21.40	12.49	29.02	12.91
Rpt-qtr	1.84	4.27	9.18	11.35	10.00	24.64	1.08	1.96	5.09
Dividend	0.61	0.28	0.26	1.95	0.00	0.71	3.95	0.62	2.35
Profit warning	0.40	1.43	0.94	2.53	0.00	2.10	1.50	0.37	1.44
Finance	0.73	1.42	1.36	2.59	6.67	1.43	0.47	1.10	1.07
Prospective:	12.74	20.87	16.49	16.66	22.00	26.98	14.86	17.72	16.37
Products	6.87	12.74	10.73	9.51	18.67	19.00	7.93	3.53	9.05
Mergers	5.47	7.08	4.71	5.99	3.33	6.90	5.57	13.95	6.27
Future prospects	0.40	1.05	1.05	1.16	0.00	1.08	1.36	0.24	1.05
Personnel:	7.28	10.82	1.04	10.86	13.34	7.81	7.64	16.89	8.53
Board change	2.33	2.49	0.52	1.40	1.67	3.21	4.43	5.65	3.30
Coy mtg	4.36	6.56	0.13	8.16	11.67	3.43	2.81	11.24	4.55
Other personnel	0.59	1.77	0.39	1.30	0.00	1.17	0.40	0.00	0.68
Other	0.62	1.00	0.64	7.25	4.16	1.60	1.13	5.66	2.64
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

information disclosed into four main groupings, shown in Table 1. Unlike periodic disclosures that often contain both financial and non-financial information disclosures, online continuous disclosures are mostly non-financial information disclosures.

Table 1 provides an overview of the frequency of disclosures by types of disclosures of the sample countries. Overall, for all eight countries summed together, disclosure for share transactions (49.6%) is the most frequent type of disclosure followed by disclosure for accounting information (22.86%). These are followed by disclosures relating to future

Table 2

Frequency of online disclosure–country statistics

Country	Class of disclosure	Companies	Mean	Std. dev.	Min.	Max.
Overall	Accounting	320	10.000	8.310	0	76
	Prospective	320	7.401	8.308	0	168
	Personnel	320	1.522	2.015	0	19
	Shares	320	19.209	25.986	0	257
	Total	320	38.204	37.233	1	342
France (FR)	Accounting	54	3.685	3.923	0	13
	Prospective	54	2.741	3.712	0	14
	Personnel	54	0.130	0.391	0	2
	Shares	54	7.630	8.457	0	47
	Total	54	14.185	11.223	1	70
Germany (DE)	Accounting	46	9.565	6.313	2	37
	Prospective	46	5.326	5.309	0	24
	Personnel	46	0.804	1.204	0	5
	Shares	46	2.457	5.592	0	34
	Total	46	18.152	14.849	3	96
Denmark (DK)	Accounting	13	2.308	1.702	0	6
	Prospective	13	1.462	1.127	0	3
	Personnel	13	0.077	0.277	0	1
	Shares	13	0.692	0.947	0	3
	Total	13	4.538	1.854	1	7
Norway (NO)	Accounting	16	34.875	15.126	10	76
	Prospective	16	30.000	37.884	10	168
	Personnel	16	3.000	4.719	0	19
	Shares	16	45.000	60.425	8	257
	Total	16	112.875	86.822	39	342
Finland (FI)	Accounting	20	11.800	3.105	4	18
	Prospective	20	12.100	6.95	1	26
	Personnel	20	2.250	2.099	0	7
	Shares	20	26.850	40.297	2	145
	Total	20	53.000	42.712	15	166
UK (UK)	Accounting	120	10.508	3.42	0	23
	Prospective	120	7.500	6.713	0	37
	Personnel	120	2.300	1.836	0	12
	Shares	120	27.308	15.11	0	84
	Total	120	47.617	18.457	12	112
Singapore (SG)	Accounting	22	11.136	4.979	3	24
	Prospective	22	9.500	7.236	0	26
	Personnel	22	2.000	1.604	0	5
	Shares	22	45.909	39.081	0	155
	Total	22	68.545	40.926	3	194
Hong Kong (HK)	Accounting	42	8.381	5.17	0	19
	Prospective	42	4.833	6.176	0	33
	Personnel	42	1.119	1.517	0	6
	Shares	42	5.167	5.392	0	21
	Total	42	19.500	11.221	1	43

prospects (16.37%) and personnel (8.53%). Observing the sub-categories, it could be said that the disclosures could also be classified into those that are driven partly by specific requirements and those that are driven more for a firm's own disclosure needs. For example,

disclosure for share transactions are driven by stock exchange and securities law requirements and disclosures of accounting information are generally specified by corporate laws and accounting standards. With the prospective type, information about mergers is often required by securities laws. Similarly, board changes have to be filed as per the corporate laws of a jurisdiction. On the whole, even if a stock exchange may not specify that these items be disclosed online, the regulatory requirements would be influencing the online disclosures as they could be regarded as material information. All stock exchanges examined in this study had requirements for disclosure of material information.

Table 2 shows that the continental European countries of France and Germany, together with Denmark and Hong Kong had significantly lower levels of disclosure. Conversely, the United Kingdom, Norway, Finland, and Singapore had significantly higher levels of disclosure. Nevertheless, further examination of the data (see Tables 1 and 2) leads to the finding that in spite of regulatory requirements, the frequency of disclosure by companies varies considerably in all the eight stock exchanges (see the standard deviation and the minimum and maximum scores of each disclosure item for each country).

Therefore, the variations in the disclosure levels are due not only to the disclosure environment of the country, but also to firm-specific reasons. The remainder of the paper deals with identifying the firm-specific, industry-specific and country-specific determinants of continuous disclosure. Some of the additional tests for specific classes of disclosures and disclosures by countries are also briefly reported.

5. The determinants of online continuous disclosure

We use the aforementioned model (Eq. (1)) to identify the key determinants of online continuous disclosure on stock exchange websites. The results of both long (15 months) and short windows (monthly) are presented in this section. We also conduct tests by major categories of information and by countries. We exclude the smallest of the major categories, personnel disclosures, from our multivariate tests as its frequencies by months were not sufficient for such tests.

5.1. Descriptives

Tables 2 and 3 provide the descriptive statistics on frequency of disclosure (dependent variables) and pattern of independent variables, respectively. The mean for all disclosures was 37.37. Share-transaction disclosures dominated the disclosure statistics. The mean for share transaction was 19.21, whereas the mean for the next highest category, disclosure of accounting, was 10.00. The mean for disclosure of prospective information was 7.40 and the mean for personnel disclosure trailed at a distant 1.52. Several of the independent variables that had skewed data were subjected to a natural log, zero-skew transformation.

Table 4 shows the Spearman Correlation for the dependent and independent variables. The table shows that the four classes of disclosure are strongly correlated with each other and the total measure (DSUM). This indicates that the variations in DSUM are representative of the variations in its components. Standard deviation of share volume (STD-VOL-LW) is strongly correlated with all the measures of frequency of disclosure. This measure of

Table 3
Descriptive statistics — long window

Variable	Mean	Median	Std. dev.	Skewness	Min.	Max.
STD-AR-LW	18.10	15.84	12.74	6.15	5.27	168.83
STD-AR-LW [†]	2.50	2.54	0.63	0.01	0.72	5.11
STD-VOL-LW	37.19	25.36	62.50	8.37	0.00	822.74
STD-VOL-LW [†]	3.21	3.28	0.89	0.01	0.10	6.71
AIP	0.25	0.18	0.23	1.08	0.00	0.95
PROPRTY	0.76	0.83	0.22	−0.60	0.31	1.00
PRODUCT CYCLE	38.58	32.91	35.17	0.53	0.00	101.00
ROE	0.19	0.11	0.32	6.30	0.00	3.83
ROE	−2.21	−2.16	1.08	0.00	−5.18	1.34
EARNFLAG	0.19	0.00	0.39	1.56	0.00	1.00
ANALYST	7.46	7.00	5.63	1.73	0.00	51.00
FLOAT	0.70	0.70	0.25	−0.23	0.20	1.00
GROWTH	2.84	1.48	8.01	12.56	−20.03	128.46
GROWTH [†]	3.27	3.24	0.18	−0.00	1.38	5.03
FINSERV	0.15	0.00	0.35	2.01	0.00	1.00
USLIST	0.06	0.00	0.24	3.68	0.00	1.00
Market capitalization (US \$ million)	503	405	389	1.44	5	2652
Total assets (non-financial services) (US \$ million)	923	547	1397	5.71	5	15,448

N=334

ASYMMETRY_F:

STD-AR-LW: standard deviation of the monthly abnormal returns for 15 months.

STD-VOL-LW: standard deviation of the ratio of monthly share turnover by total shares outstanding for 15 months.

AGENCY_F: tangible assets to total assets (assets-in-place (AIP) or asset specificity).

PROPRIETARY_F: industry concentration computed by dividing the total revenues in the industry, measured by the two-digit SIC, by the number of firms in that industry (PROPRTRY).

PRODUCT CYCLE_F: days in inventory of products (PRODUCT CYCLE).

PERFORMANCE_F: absolute value of return on equity (ROE).

EARNFLAG_F: 1=profit firm and 0=loss firm (EARNFLAG).

ANALYST_F: analyst coverage measured by the number of forecasts of EPS (ANALYST).

OWNERSHIP_F: spread of ownership as determined by MSCI (free float) (OWNERSHIP).

GROWTH_F: growth prospects (GROWTH) measured by market to book value.

FINSERV_F: 1=financial firm and 0=non-financial firm.

USLIST_F: listing on NYSE or NASDAQ. 1=listing and 0=no listing (USLIST).

asymmetry is, in turn, strongly correlated with the alternative measure, standard deviation of market returns (STD-AR-LW). Interestingly, this latter measure is not significantly correlated with any of the disclosures. The other firm-level variables that are most strongly correlated with disclosure are assets-in-place (AIP) (+ve) product cycle (PRODUCT-CYCLE) (−ve), return on equity (ROE) (+ve), earnings flag (EARNINGSFLAG) (+ve) and ownership spread (FLOAT) (+ve) and financial services indicator (FINSERV). Among countries that were significantly associated, the United Kingdom (UK), Singapore (SG) and Norway (NO) had +ve signs and Germany (DE), Denmark (DK), France (FR) and Hong Kong (HK) had −ve signs.

Correlation among the independent variables was generally low (less than 50%). The only high bivariate correlations among independent variables were those between UK and

FLOAT (0.5879), which suggests that UK firms had the highest average shareholder spread among all eight countries.

5.2. Multivariate (regression) analyses — long window

Given that the dependent variables were frequencies of disclosure, coupled with the clear evidence of over-dispersion shown in Table 3, we use appropriate regression techniques for count data. For analysis of the total level of disclosures we use negative binomial regression analysis. For analysis of the components of disclosure, we employ zero-inflated negative binomial regression analysis (Gardner, Mulvey, & Shaw, 1995; Long, 1997; Long & Freese, 2001; Winkelmann, 2001).⁷

We conducted analysis on all possible combinations of the variables with total disclosure: asymmetry, agency, performance, proprietary cost competition, and product cycle. This procedure, with multiple proxies for some of the variables, provided evidence of a strong association between the disclosure variables and the independent variables. Where more than one proxy existed, we report results for only one of the proxies of a variable, with the exception of asymmetry.

Table 5 shows the determinants of total disclosure under both measures of asymmetry, STD-AR-LW and STD-VOL-LW. Columns (1) and (2) provide results for the total disclosures (TOTAL) sample, and columns (3) to (8) provide results for three major categories of disclosure, accounting information (ACCOUNTING), prospective information (PROSPECTIVE), and shares-trading information (SHARES). We found that the strongest factor in determining the total level of disclosure was the extent of asymmetry, measured by the standard deviation of market-adjusted returns and trading volumes. Between the two proxies (as found by Cready & Hurtt, 2002), the volume measure had the stronger association. Results for ACCOUNTING and SHARES were similar to that of TOTAL, but results for PROSPECTIVE were very strong. This is understandable, since prospective-disclosure items could be regarded as the most voluntary among the three types of disclosures, ACCOUNTING, PROSPECTIVE, and SHARES. As for countries, the United Kingdom (UK),⁸ Singapore (SG), Norway (NO), and Finland (FI) had generally positive signs with significance ($p < 0.05$). Germany (DE), Denmark (DK), France (FR), and Hong Kong (HK) had generally negative signs with significance ($p < 0.05$). Both the United Kingdom and Singapore, which comprised 43% of our sample, are common-law countries. Germany and France, which comprised 30% of our sample, are code-law countries. This finding coincides with the findings of existing corporate

⁷ Negative binomial regression is a GLM technique that is appropriately applied to analysis of count data subject to over-dispersion and excess zeroes. The extent of over-dispersion in our dependent variable, evident in Table 3, was confirmed when we conducted graphical and formal likelihood ratio tests for over-dispersion when testing whether a Poisson or negative binomial model best fitted the data (Long & Freese, 2001, 246). When analysing the components of disclosure, the Vuong test was employed to test whether the zero-inflated negative binomial regression analysis should be employed (Vuong, 1989). Whilst all corporations made some type of disclosure, not all companies made a disclosure in each of the classes of disclosure. A zero-inflated negative binomial regression is appropriate in most cases (Lambert, 1992).

⁸ UK is not included in Table 5 due to the limitations of the multivariate procedure used. One of the country dummies has to be dropped for the procedure. Additional tests, including our bivariate tests (Table 4), show a significant association between UK and the disclosure frequencies.

Table 4
Spearman correlation

	DSCSUM	DSCACCTG	DSCPRSNL	DSCPRSP	DSCSHRS	STD-AR-LW	STD-VOL-LW	AIP	PROPERTY	PRODUCT CYCLE
DSCSUM	1									
DSCACCTG	0.6785*	1								
DSCPRSNL	0.4925*	0.4344*	1							
DSCPRSP	0.6800*	0.6403*	0.5338*	1						
DSCSHRS	0.8732*	0.3320*	0.2503*	0.2804*	1					
STD-AR-LW	0.077	0.0231	0.0616	0.0616	0.0704	1				
STD-VOL-LW	0.4127*	0.3944*	0.4312*	0.6073*	0.1589*	0.1357*	1			
AIP	0.1110*	0.103	0.0447	0.0003	0.1225*	0.0419	0.0158	1		
PROPERTY	0.0088	0.0811	0.1319*	0.0442	0.0229	0.0425	0.0177	0.1968*	1	
PRODUCT CYCLE	0.1205*	0.1062	0.1736*	0.1288*	0.0676	0.0373	0.1446*	0.1712*	0.0387	1
ROE	0.0982	0.1254*	0.1537*	0.1194*	0.0347	0.0217	0.1959*	0.0653	0.0719	0.1054
EARNFLAG	0.1223*	0.2094*	0.2263*	0.2483*	0.0206	0.0781	0.2325*	0.0146	0.0823	0.1521*
ANALYST	0.0236	0.0043	0.0654	0.0113	0.0324	0.0684	0.0852	0.0171	0.1009	0.0528
FLOAT	0.2222*	0.1357*	0.2573*	0.0765	0.2207*	0.0408	0.1523*	0.1970*	0.2157*	0.1274*
USLIST	0.007	0.0352	0.0092	0.0787	0.0558	0.0076	0.0359	0.0866	0.0797	0.1157*
GROWTH	0.0404	0.1832*	0.0675	0.0207	0.0041	0.0255	0.1010	0.0795	0.0138	0.1361*
FINISRV	0.0671	0.0348	0.0648	0.0158	0.083	0.0861	0.1065	0.3668*	0.0784	0.0318
UK	0.1937*	0.0479	0.2843*	0.0031	0.2386*	0.084	0.1280*	0.1871*	0.4551*	0.2447*
DE	0.2200*	0.0212	0.1472*	0.0731	0.2639*	0.0228	0.0409	0.0857	0.0838	0.1052
DK	0.1791*	0.1930*	0.1417*	0.096	0.1409*	0.0343	0.0392	0.0352	0.1633*	0.0461
SG	0.2259*	0.0382	0.064	0.0492	0.2842*	0.0723	0.0503	0.0133	0.0442	0.065
NO	0.4452*	0.6738*	0.1846*	0.4557*	0.2034*	0.0278	0.2546*	0.0816	0.1654*	0.0793
FR	0.2826*	0.3375*	0.3093*	0.1807*	0.1917*	0.0163	0.1085	0.1609*	0.0086	0.0732
HK	0.1807*	0.0674	0.0735	0.0824	0.1945*	0.0136	0.0754	0.0862	0.1801*	0.1007
FI	0.1057	0.0573	0.0929	0.1045	0.0787	0.0006	0.067	0.0534	0.2396*	0.0544

ROE	ROE	EARN	ANALYST	FLOAT	USLIST	GROWTH	FINSERV	UK	DE	DK	SG	NO	FR	HK
1	1	1												
EARN	0.2834*													
ANALYST	-0.0976	-0.1585*	1											
FLOAT	0.0641	-0.0386	-0.0804	1										
USLIST	0.0712	0.2122*	0.1896*	0.0092	1									
GROWTH	0.2230*	0.1606*	-0.0327	-0.0341	0.0122	1								
FINSERV	-0.0555	-0.1311*	-0.1331*	-0.1925*	-0.1051	-0.0506	1							
UK	0.0975	0.0743	-0.2761*	0.5879*	-0.0333	0.0137	-0.1151*	1						
DE	0.0206	0.0887	-0.0896	-0.1982*	0.0776	0.0064	-0.0709	-0.3086*	1					
DK	-0.058	-0.0651	0.0181	0.0617	-0.0558	-0.0269	0.0332	-0.1652*	-0.0895	1				
SG	-0.0642	-0.0694	-0.0102	-0.1514*	-0.0174	-0.0585	0.1648*	-0.2023*	-0.1097*	-0.0587	1			
NO	0.1008	0.1539*	0.0137	0.0439	0.0052	0.2163*	-0.0493	-0.1652*	-0.0895	-0.0479	-0.0587	1		
FR	-0.0458	-0.1098*	0.3951*	-0.3035*	0.022	-0.0348	-0.0473	-0.3387*	-0.1836*	-0.0983	-0.1204*	-0.0983	1	
HK	-0.054	-0.0182	-0.092	-0.3557*	0.0055	0.0328	0.2201*	-0.2608*	-0.1414*	0.0757	-0.0927	-0.0757	-0.1551*	1
FI	-0.0563	0.0926	0.1708*	0.1073	-0.0117	-0.0419	-0.0334	-0.1923*	-0.1042	-0.0558	-0.0683	-0.0558	-0.1144*	-0.0881

*Significant at 5%.

DSCSUM: total disclosures.

DSCACCTG: accounting disclosures.

DSCPRSNL: personnel disclosures.

DSCPRSP: prospective disclosures.

DSCSHRS: share transaction disclosures.

ASYMMETRY: ;

STD-AR-LW: standard deviation of the monthly abnormal returns for 15 months.

STD-VOL-LW: standard deviation of the ratio of monthly share turnover by total shares outstanding for 15 months.

AGENCY: ; tangible assets to total assets (asset-in-place (AIP) or asset specificity).

PROPRIETARY: ; industry concentration computed by dividing the total revenues in the industry, measured by the two-digit SIC, by the number of firms in that industry (PROPRTRY).

PRODUCT CYCLE_{it}: days of inventory (PRODUCT CYCLE).PERFORMANCE_{it}: absolute value of return on equity (ROE).EARNFLAG_{it}: 1 = profit firm and 0 = loss firm (EARNFLAG).ANALYST_{it}: analyst coverage measured by the number of forecasts of EPS (ANALYST).FLOAT_{it}: spread of ownership as determined by MSCI (free float) (OWNERSHIP).GROWTH_{it}: growth prospects (GROWTH) measured by market to book value.FINSERV_{it}: 1 = financial firm and 0 = non-financial firm.USLIST_{it}: listing on NYSE or NASDAQ. 1 = listing and 0 = no listing (USLIST).

Table 5

Determinants of continuous disclosure — long-window results

	Total		Accounting		Prospective		Shares	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
STD-AR-LW (+ve)	0.130*		0.097*		0.158+		0.131	
	2.287		2.180		1.763		1.415	
STD-VOL-LW (+ve)		0.138**		0.071+		0.238**		0.208*
		2.836		1.937		3.436		2.394
AIP (-ve)	-0.205	-0.172	-0.079	-0.057	-0.546*	-0.430+	-0.013	0.015
	1.243	1.039	0.615	0.439	2.105	1.664	0.050	0.059
PROPRTY (-ve)	0.298	0.240	0.129	0.081	-0.037	-0.180	0.511+	0.469
	1.576	1.279	0.843	0.533	0.125	0.615	1.698	1.580
PRODUCT CYCLE (?)	-0.000	-0.000	-0.000	-0.000	-0.003+	-0.003+	0.001	0.001
	0.436	0.319	0.180	0.202	1.782	1.671	0.505	0.609
ROE (-ve)	-0.030	-0.026	-0.008	-0.006	-0.163**	-0.159**	0.002	0.009
	0.872	0.778	0.288	0.230	2.983	2.989	0.034	0.159
EARNFLAG (?)	0.150	0.075	0.044	0.012	0.648**	0.509**	-0.110	-0.196
	1.463	0.715	0.572	0.155	4.159	3.268	0.671	1.194
ANALYST (+ve)	0.009	0.010	0.008	0.009	0.034**	0.035**	-0.018	-0.017
	1.197	1.362	1.344	1.520	2.751	2.888	1.447	1.371
FLOAT (+ve)	0.042	-0.060	-0.003	-0.059	-0.171	-0.323	0.081	-0.063
	0.208	0.299	0.017	0.375	0.544	1.046	0.230	0.184
GROWTH (-ve)	-0.002	-0.002	0.001	0.001	0.003	0.004	-0.006	-0.006
	0.495	0.517	0.294	0.273	0.315	0.386	0.984	1.069
FINSERV	-0.072	-0.074	0.052	0.049	0.162	0.167	-0.212	-0.176
	0.622	0.653	0.568	0.539	0.913	0.968	1.094	0.919
USLIST	0.052	0.027	0.052	0.028	0.371	0.395+	0.034	-0.028
	0.343	0.180	0.447	0.242	1.594	1.723	0.133	0.109
DE	-1.055**	-0.969**	-0.127	-0.078	-0.467*	-0.272	-2.066**	-1.977**
	7.608	6.804	1.230	0.727	2.232	1.262	7.406	7.083
DK	-2.395**	-2.372**	-1.533**	-1.514**	-1.364**	-1.291**	-3.947**	-3.912**
	9.851	9.771	6.288	6.203	3.615	3.457	7.811	7.758
SG	0.373*	0.412**	0.034	0.040	0.236	0.290	0.513*	0.603*
	2.434	2.674	0.286	0.337	1.027	1.277	2.120	2.469
NO	0.761**	0.669**	1.161**	1.116**	1.291**	1.119**	0.359	0.208
	4.405	3.838	10.165	9.745	5.231	4.574	1.330	0.759
FR	-1.301**	-1.247**	-0.812**	-0.782**	-1.233**	-1.125**	-1.080**	-0.986**
	9.222	8.709	5.918	5.614	5.191	4.770	4.727	4.254
HK	-0.985**	-0.942**	-0.082	-0.047	-0.596*	-0.497*	-1.879**	-1.863**
	6.083	5.815	0.645	0.365	2.339	1.971	6.849	6.834
FI	-0.009	0.078	0.037	0.093	0.496*	0.694**	-0.085	0.033
	0.058	0.471	0.309	0.759	2.113	2.882	0.331	0.124
Constant	3.235**	3.202**	1.972**	2.044**	1.233*	0.987*	2.723**	2.483**
	10.175	10.611	8.122	8.790	2.474	2.186	5.028	4.781
Observations ^{TT}	300	300	300	300	300	300	300	300
Likelihood ratio χ^2	275.166	278.016	216.359	215.405	156.776	166.405	199.464	203.092
Prob > χ^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

governance and international accounting literature, which suggest that companies in common-law countries disclose more than the companies in code-law countries (Shleifer & Vishny, 1997; Standard & Poors, 2002). Also, Finnish, Norwegian, and Singaporean

firms could have had higher frequencies because these countries have greater specificity in the requirements for disclosure of material information.

As for PROSPECTIVE, the significant variables (at significance level $p < 0.05$), apart from asymmetry, were AIP (–ve), ROE (–ve), EARNFLAG (–ve), and ANALYST (–ve). The results for AIP and ANALYST were as hypothesized. The results for performance variables, ROE and EARNFLAG, were contrary to the hypotheses. The results suggest that profitable firms have higher frequencies of disclosure.

5.3. Short window data tests

To test the robustness of the result, especially with regard to spread or regularity, we conducted additional tests with short-window (monthly) data. Monthly data for income-statement and balance-sheet items are not available because financial statements are at best produced quarterly. Quarterly and semi-annual information could be used, but such information is not readily available for all firms in Global Vantage.

The asymmetry proxies were computed for the immediate past four months. This was done such that we could see the effects of the immediate past asymmetry and performance situation on the current month's disclosure frequency. Four months data were taken to allow sufficient variability in the computation of the standard deviation. For returns, the current month's returns were used. To reduce serial correlation, between panels cross-sectional time series negative binomial regression models were used for multivariate analyses. The same overall pattern of disclosure as observed for the long window, were found for the short window, as shown in Table 6.

The following observations were made for asymmetry proxies. Disclosure was significantly associated with STD-AR-SW ($p < 0.001$). Although the abnormal-residual variation (STD-VOL-SW) is not strongly and consistently significant, its positive association with all the disclosure proxies lends support to the hypothesis that higher

Notes to Table 5:

T statistics †significant at 10%; *significant at 5%; **significant at 1%.

[†]Subject to log transformation ^{††}34 observations dropped due to data availability.

ASYMMETRY_{*t*}:

STD-AR-LW: standard deviation of the monthly abnormal returns for 15 months.

STD-VOL-LW: standard deviation of the ratio of monthly share turnover by total shares outstanding for 15 months.

AGENCY_{*t*}: tangible assets to total assets (assets-in-place (AIP) or asset specificity).

PROPRIETARY_{*t*}: industry concentration computed by dividing the total revenues in the industry, measured by the two-digit SIC, by the number of firms in that industry (PROPRTRY).

PRODUCT CYCLE_{*t*}: days of inventory (PRODUCT CYCLE).

PERFORMANCE_{*t*}: absolute value of return on equity (ROE).

EARNFLAG_{*t*}: 1=profit firm and 0=loss firm (EARNFLAG).

ANALYST_{*t*}: analyst coverage measured by the number of forecasts of EPS (ANALYST).

FLOAT_{*t*}: spread of ownership as determined by MSCI (free float) (OWNERSHIP).

GROWTH_{*t*}: growth prospects (GROWTH) measured by market to book value.

FINSERV_{*t*}: 1=financial firm and 0=non-financial firm.

USLIST_{*t*}: listing on NYSE or NASDAQ. 1=listing and 0=no listing (USLIST).

Table 6
Determinants of continuous disclosure – short-window results

	Accounting			Prospective			Shares	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
STD-VOL-SW (+ve)		0.006		0.026		-0.037		0.018
STD-AR-SW (+ve)	0.081**	0.250		0.715		0.884		0.518
AIP (+ve)	3.487		0.085*		0.107**		0.078*	
	-0.200	-0.278+	2.438		2.748		2.312	
PROPTY (-ve)	1.201	1.676	0.792	-0.178	-0.520*	-0.633*	0.085	-0.013
	-0.065	-0.043	0.109	1.175	2.068	2.546	0.402	0.063
PRODUCT CYCLE (?)	0.337	0.222	0.642	0.112	-0.384	-0.233	0.226	0.217
	-0.001	-0.001	0.000	0.647	1.331	0.815	0.903	0.862
ROE ¹ (+ve)	1.055	0.817	0.104	0.000	-0.003*	-0.003+	-0.001	0.000
	0.002	-0.003	-0.014	0.122	2.068	1.754	0.784	0.306
EARNFLAG (?)	0.067	0.088	0.456	-0.011	-0.140**	-0.150**	0.049	0.045
	0.240*	0.243*	0.066	0.340	2.613	2.858	1.039	0.975
ANALYST (+ve)	2.302	2.332	0.761	0.056	0.553**	0.594**	-0.116	-0.131
	0.021**	0.019*	0.020**	0.625	3.706	3.995	0.843	0.958
FLOAT (+ve)	2.662	2.468	3.028	0.019**	0.018	0.020+	0.004	0.001
	0.246	0.257	0.001	2.822	1.582	1.760	0.354	0.064
GROWTH ¹ (+ve)	1.170	1.235	0.005	-0.110	-0.717*	-0.481	0.739**	0.640*
	-0.014	-0.005	-0.034	0.599	2.325	1.579	2.631	2.302
FINSERV	0.125	0.041	0.322	0.001	0.000	0.004	0.002	0.003
	0.130	0.084	0.085	0.342	0.045	0.517	0.365	0.551
USLIST	0.793	0.520	0.626	-0.046	0.030	0.098	0.044	-0.003
	-1.343**	-1.302**	-0.623**	0.436	0.173	0.577	0.285	0.021
DE	9.176	8.784	5.026	0.063	0.302	0.182	-0.315	-0.281
	-2.447**	-2.582**	-1.547**	0.464	1.375	0.835	1.486	1.350
DK	9.839	10.375	6.113	-0.604**	-0.674**	-0.712**	-2.732**	-2.547**
	-1.023**	-1.069**	-0.046	4.670	3.274	3.436	11.913	11.267
SG	6.905	7.239	0.333	-1.656**	-1.332**	-1.502**	-4.052**	-4.176**
				6.474	3.700	4.165	7.967	8.205
				-0.106	-0.062	-0.042	-1.349**	-1.412**
				0.749	0.273	0.186	7.695	7.996

NO	-0.507**	-0.574**	0.772**	0.683**	0.887**	0.828**	-0.931**	-1.012**
	3.161	3.568	5.365	4.542	3.837	3.616	4.720	5.110
FR	-1.294**	-1.323**	-1.207**	-1.250**	-1.374**	-1.377**	-1.220**	-1.280**
	8.796	8.922	8.691	8.735	6.188	6.198	6.454	6.664
HK	-1.095**	-1.155**	-0.516**	-0.567**	-0.820**	-0.846**	-1.596**	-1.707**
	6.542	6.925	3.407	3.662	3.267	3.409	6.761	7.181
FI	-0.449**	-0.474**	0.146	0.166	0.694**	0.627**	-1.243**	-1.267**
	2.852	2.981	1.120	1.213	3.024	2.725	6.192	6.231
Constant	0.978**	1.179**	-0.315	-0.005	0.957*	1.000*	0.162	0.461
	3.492	4.203	1.190	0.020	2.229	2.357	0.436	1.231
Total observations	4398	4556	4398	4556	4398	4556	4398	4556
Firm of observations	304	304	304	304	304	304	304	304
Likelihood ratio χ^2	393.711	383.889	282.2	258.971	176.349	170.388	437.624	431.851
Prob > χ^2	0	0	0	0	0	0	0	0

T statistics: *significant at 10%; **significant at 5%; ***significant at 1%.

[†]Subject to log transformation ^{††} 30 observations dropped due to data availability. See Table 4 for description of variables.

ASYMMETRY_{*i*}:

STD-AR-SW: standard deviation of abnormal returns of the immediate past four months for the monthly data of the short window.

STD-VOL-SW: standard deviation of the ratio of monthly share turnover by total shares outstanding for the immediate past four months.

AGENCY_{*i*}: tangible assets to total assets (assets-in-place (AIP) or asset specificity).

PROPRIETARY_{*i*}: industry concentration computed by dividing the total revenues in the industry, measured by the two-digit SIC, by the number of firms in that industry (PROPRTRY).

PRODUCT CYCLE_{*i*}: days of inventory (PRODUCT CYCLE).

PERFORMANCE_{*i*}: absolute value of return on equity (ROE).

EARNFLAG_{*i*}: 1 = profit firm and 0 = loss firm (EARNFLAG).

ANALYST_{*i*}: analyst coverage measured by the number of forecasts of EPS (ANALYST).

FLOAT_{*i*}: spread of ownership as determined by MSCI (free float) (OWNERSHIP).

GROWTH_{*i*}: growth prospects (GROWTH) measured by market to book value.

FINSERV_{*i*}: 1 = financial firm and 0 = non-financial firm.

USLIST_{*i*}: listing on NYSE or NASDAQ. 1 = listing and 0 = no listing (USLIST).

Table 7
Pattern of determinants of disclosure by country (long-window tests)

CTRY	DISC	ASYMMETRY STD-VOL-LW	AIP	PROPRTY	PRODUCT CYCLE	ROE	EARNFLAG	ANALYST	FLOAT	USLIST	GROWTH	FINSERV	N	Prob
FR	TOTAL	0.261	1.041	0.032	0.006+	0.066	1.286**	-0.006	0.034	0.684+	0.013	-0.719+	49	0.089
	ACCOUNTING	0.392	2.337	0.325	0.002	-0.059	1.820**	0.015	1.014	0.258	0.079	0.845	49	0.719
	PROSPECTIVE	0.055	2.454	0.736	0.002	-0.406	2.454*	0.001	2.291+	1.311*	0.087	0.406	49	0.066
	SHARE	-0.503*	-0.823	0.222	0.013**	1.511*	1.511*	0.020	1.087	0.597	0.018	-1.545*	49	0.016
DF	TOTAL	0.313**	0.362	0.443	0.002	-0.252*	-0.158	0.029*	-0.741*	-0.095	0.059*	0.306	41	0.025
	ACCOUNTING	0.187+	0.290	0.195	0.002	-0.164	-0.392	0.020	-0.475	0.125	0.039	0.449	41	0.074
	PROSPECTIVE	0.286*	0.721	1.339	-0.003	-0.207+	0.151	0.049**	-0.715	-0.418	0.097**	-0.572	41	0.042
	SHARE	0.670*	2.955+	0.175	0.003	-0.864**	0.577	0.070+	-1.678	-0.488	0.108	1.439	41	0.214
UK	TOTAL	0.091	-0.182	0.152	0.002	-0.012	0.003	0.038**	0.262	0.428*	0.004	-0.099	111	0.046
	ACCOUNTING	0.023	-0.041	0.024	-0.001	0.024	-0.152	0.005	0.174	0.504**	0.003	0.012	111	0.248
	PROSPECTIVE	0.001	0.786**	0.157	-0.007**	-0.120+	0.210	0.033	-0.516	0.684**	-0.001	-0.434	111	0.008
	SHARE	0.103	-0.060	0.042	0.002	0.017	0.044	0.051**	0.391	0.200	0.005	0.252	111	0.170
SG	TOTAL	0.017	-1.357*	0.450	-0.018*	-0.064	0.279	0.045	0.322	-1.497	0.393	0.216	22	0.042
	ACCOUNTING	0.305	0.409	1.193	0.001	0.172	0.230	0.010	0.266	0.852	-0.272	0.140	22	0.058
	PROSPECTIVE	0.852**	0.404	0.515	-0.020**	0.499*	-0.083	0.023	2.688**	1.839	-0.207	2.403**	22	0.000
	SHARE	-0.173	1.729*	0.253	-0.023**	-0.245	0.274	0.051	0.109	-3.167	0.569	-0.247	22	0.006
HK	TOTAL	0.433*	0.121	1.387	0.002	-0.067	0.538+	0.005	0.068	-0.065	0.025	0.497	32	0.334
	ACCOUNTING	0.168	0.708	1.801	-0.002	-0.318+	0.171	0.039	1.037	-0.976	0.061	0.648	32	0.577
	PROSPECTIVE	0.510	0.032	1.211	0.013	-0.182	1.252*	0.005	-4.146*	-0.035	0.075+	0.844	32	0.007
	SHARE	1.072**	1.233	4.456**	0.019*	0.405*	0.821	-0.004	-1.322	1.176+	-0.076	1.701*	32	0.023

* Significant at $p < 0.1$, **significant at $p < 0.05$, ***significant at $p < 0.01$. See Table 4 for description of variables.

ASYMMETRY₁:

STD-AR-LW: standard deviation of the monthly abnormal returns for 15 months.

STD-VOL-LW: standard deviation of the ratio of monthly share turnover by total shares outstanding for 15 months.

AGENCY₁: tangible assets to total assets (assets-in-place (AIP) or asset specificity).

PROPRIETARY₁: industry concentration computed by dividing the total revenues in the industry, measured by the two-digit SIC, by the number of firms in that industry (PROPRTRY).

PRODUCT CYCLE₁: days in inventory of products (PRODUCT CYCLE).

PERFORMANCE₁: absolute value of return on equity (ROE).

EARNFLAG₁: 1=profit firm and 0=loss firm (EARNFLAG).

ANALYST₁: analyst coverage measured by the number of forecasts of EPS (ANALYST).

FLOAT₁: spread of ownership as determined by MSCI (free float) (OWNERSHIP).

GROWTH₁: growth prospects (GROWTH) measured by market to book value.

FINSERV₁: 1=financial firm and 0=non-financial firm.

USLIST₁: listing on NYSE or NASDAQ. 1=listing and 0=no listing (USLIST).

asymmetry firms will have higher disclosures. It is also important to note that, in this respect, firms with more price volatility tend to disclose more frequently as well as regularly.

Also significant in the TOTAL disclosure regression (columns (1) and (2)) was (EARNFLAG) (+ve), which indicates that highly profitable companies tend to make disclosure more regularly than less profitable ones. Results for most other variables were similar to those of the long-window tests.

Similar to long-window tests, PROSPECTIVE disclosure had the strongest set of results. The variables strongly associated with PROSPECTIVE were assets-in-place (AIP) (–ve), product cycle (PRODUCTCYCLE) (–ve), return on equity (ROE) (+ve), earnings flag (EARNFLAG) (+ve), and ownership (FLOAT) (–ve) with disclosure. Unlike the long-window tests, analyst following (ANALYST) had only a weak association.

We also found there was no positive association between country membership and total disclosure or the other three types of disclosure. Most coefficients, in this regard, were negative, which suggests that a country's environment in this area has little positive influence on the regularity of disclosures.

5.4. Additional analyses

Given the national differences in disclosure, we conducted additional analyses with the total and various classes of disclosure, country by country (Table 7).⁹ Since there were insufficient observations for short-window tests, we conducted long-window tests. We found that, similar to the earlier long-window and short-window results, with the exception of Hong Kong, the firm-level determinants of disclosure are more strongly associated with prospective information than they are with disclosures of an accounting nature or for market relevant share transactions. Again, with some exceptions, the results were mostly similar to those of the earlier long-window and short-window tests.

There are a few interesting exceptions at the national level. In the United Kingdom, which accounts for most of the overall sample listed on U.S. markets, USLIST is positively associated with such disclosures. The level of dispersion in ownership (FLOAT) is positively associated with prospective disclosures in France and Singapore. More interestingly, information asymmetry is not a strong or positively associated variable for all countries. It is only strong and positive for Germany (DE), Singapore (SG), and Hong Kong (HK). Also, previous weak variable proprietary cost (PROPRTY) is significant for these countries (<0.001). Financial services (FINSERV) is significant in many instances, suggesting some additional motivations in the financial services industry by country.

We also conducted a series of additional analyses, not reported here, including testing the effect of firm size on disclosure. As expected, given the design of the study, firm size was not a statistically significant influence on either total disclosure or on the components of disclosure.

5.5. Discussion

Barring some variations by country, on the whole, the analyses using both long and short windows suggest that information asymmetry is a strong driver of online

⁹ The relationships for Denmark, Norway, and Finland are not disclosed as there are insufficient observations

disclosures followed by agency, production cycle, profitability, ownership, and country influences.

There are some striking differences in the pattern of disclosure by types. While the country-level determinants are still in the same direction as the overall level of disclosure, there are clear distinctions between share and accounting disclosures, on the one hand, and prospective disclosures, on the other. The former classes of disclosure seem to be more strongly associated with national factors, whereas the level of prospective disclosures has a stronger association with firm-level characteristics. As can be predicted from theory, the level of prospective disclosures seems associated not only with the level of asymmetry observed for the total level of disclosure but also with assets-in-place (–ve, as predicted), return on equity (–ve, not as predicted), whether the firm was profit-making (+ve, not as predicted), and ownership spread (+ve, as predicted).

As demonstrated by Cready and Hurtt (2002), our price and volume measures of symmetry are associated with the same sign, signifying that they are robust measures of information asymmetry.

When we conducted additional analyses based on the various classes of disclosure we found that the asymmetry associations seem to be strongest for prospective information and weakest for disclosure of share information, with the other categories ranging in between. The reason for the strength in the case of prospective information could be that most such disclosures are not driven by regulatory needs. They are driven by firms' own needs to provide information to investors, such that the investors' transaction cost to acquire such information is reduced, which in turn minimizes the cost of capital of the firm. Conversely, disclosure of share transactions is heavily influenced by securities and stock market regulations that require disclosure of significant movements in shares and insiders trading their shares. Although the rules vary, all the eight exchanges in this study had significant requirements for disclosing share transactions. Similar disclosure rules exist for accounting, such as rules for the issue of annual and interim reports and preliminary announcements or profit warnings.

The country-by-country tests raise more questions than answers. While the overall results are robust, because they are representative of the eight-country sample as a whole, they are not exact representations of the country results. Rather, they provide a composite view of the various effects within countries. For example, asymmetry is not positively associated with total disclosure in all countries. In one of the countries it is negatively associated and in three it is not significantly associated with total frequency. This suggests that the influence of information asymmetry in the full-sample tests comes from the three countries where it is significantly positively associated with frequency of disclosure.

To account for variations in total disclosures by country, we looked closely at Finland, Norway, and Singapore, where a more explicit disclosure mechanism led us to expect a higher frequency of continuous disclosure. In our TOTAL disclosure tests and disclosure by type of information tests we do find that these countries have higher frequencies of disclosure.

Putting the full-sample test with all disclosures, the tests by types of disclosure and the country-disclosure tests together, we observe that the results by prospective-information disclosures is by far the strongest set of results. Therefore, the discretionary types of continuous disclosure are determined by certain firm-level variables.

6. Conclusions

Continuous online disclosure is becoming a common form of disclosure. Extant research in accounting and accounting practices still regards periodic disclosure as the dominant form of disclosure. A recent study, Landsman and Maydew (2002), finds quarterly reporting (a more frequent form of disclosure) to be more informative than or just as good as the annual form of reporting. Butler et al. (2002) find that quarterly reporting is a more timely form of reporting. Given the advent of online disclosure, it is pertinent to assume that the continuous forms of disclosure would take a share in the market for corporate information. Our study attempts to explain the nature of online disclosure and identify the determinants of such disclosures. We focus on readily accessible online disclosures. Since such disclosures are available globally we cover the announcements made in eight Asian and European stock exchanges.

Similar to the findings of Botosan and Harris (2000) and Butler et al. (2002), we find that firms with higher information asymmetry are more likely to report frequently. Our results show some support, especially for more discretionary types of disclosure like prospective-information disclosure, for the evidence of prior studies in the area of voluntary disclosure and frequency of disclosure. Akin to the findings of Leftwich et al. (1981) and Butler et al. (2002) in the area of quarterly reporting, we find that firms with agency costs have a tendency to report more frequently. Analogous to the argument raised by Miller (2002), we also find that profit-making firms disclose more. Our evidence also shows strong support for the hypothesis that the firms with lower shorter operating cycles (Butler et al., 2002) and more analyst following report more frequently (Nagar et al., 2003; Skinner, 2003).

Since our short-window (monthly) results are as strong or stronger for most variables with strong results in the long window (15 month), we construe that our findings apply to both the level of frequency and the spread or regularity of disclosures. With respect to continuous disclosure and its two features, frequency and spread/regularity, our study has dealt with a growing phenomenon in the area of disclosure. Our study found several interesting variations in results when tests were conducted between types of disclosure and for tests by country. On the one hand, we did find some generalizable results; on the other hand, we have raised issues for further research.

This study has some limitations. Information asymmetry in markets is difficult to measure (Botosan & Harris, 2000; Butler et al., 2002). The proxies used in this study are based on the most recently used measures of asymmetry. However, these measures may suggest an alternate hypothesis, that of a reverse causality between disclosure and the proxies. Based on market reaction studies (e.g., see Cready & Hurtt, 2002), this alternate hypothesis would be that the more frequent the disclosure the more frequent the variations of stock price and volume, (i.e., frequency of online disclosure would drive variations in stock price and volume). We have disregarded this view. Since we are studying the frequency of continuous disclosure (not periodic disclosure) we feel that the more often the firm makes its disclosures, the more aligned the information set for outsiders would be with that of insiders. This would reduce the surprise element when information is released to the market. One way to remove doubts about our view would be to examine the after disclosure effects of online disclosures (Botosan & Harris, 2000; Butler et al., 2002). However, such a test is difficult to

conduct because as frequency increases it is difficult to isolate the effects of one disclosure from that of another. Nevertheless, this issue could be a subject of future research.

With improvements in technology, the Internet is rapidly becoming the most important information source for investors. Firms are rapidly recognizing this change. The internet is also much more powerful than the paper form of reporting (Debreceeny et al., 2002). It allows many forms of providing information (e.g., HTML and Adobe Acrobat formats), hyperlinking to other databases, and immediate dissemination and accessibility of information. These advantages have led to increased demand for information and the way information is provided. Continuous disclosure, or the expectation that firms should continuously inform the investors, has become a common issue in the capital markets. To provide for good quality information dissemination under the concept of continuous disclosure, it is essential that policy makers and corporate managers understand the forms available and the reasons behind online disclosures.

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Discussion

Discussion of “Firm specific determinants of continuous corporate disclosure”

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In this paper Debreceeny and Rahman (2005) investigate whether continuous disclosure is associated with the same variables as voluntary disclosure and disclosure frequency in particular. To that end nine hypotheses of continuous disclosure are formulated and tested. Frequency and regularity of online disclosures on stock exchange websites in eight developed markets in Asia and Europe are examined. Sample firms included in the analysis are 334 Morgan Stanley small-cap firms from eight different countries. A continuous disclosure model is proposed and the dependent variable is a self-constructed disclosure variable aggregated from manually collected Internet disclosures on stock exchange websites. The types of information disclosures included vary widely and some disclosures are mandatory whilst others are not. The explanatory variables of the proposed continuous disclosure model include measures of information asymmetry, agency costs, proprietary cost, operating cycle, performance, analyst following, free float, industry, US listing and country. The inclusion of these variables in the model is motivated by referring to the literature on voluntary disclosure. For the full sample (eight countries together), significant positive associations are found of the various continuous disclosure sub-measures with information asymmetry measures and country variables. Depending on the type of disclosure sub-measure being used as dependent variable, different results are found for the other test variables, but in most cases the results on these variables are not statistically significant.

As only limited research has been done on the factors driving continuous disclosure and most other disclosure studies do not focus on small-cap firms, this study is potentially interesting and definitely challenging. The authors' manual data collection efforts of

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various types of continuous disclosure items are quite impressive: 12,673 announcements for 334 firms over a period of 15 months are identified. The results are however less impressive, as all but one test variable (information asymmetry) are statistically insignificant in the models presented in Table 5. In the remainder of this discussion I elaborate on possible reasons why the results in this study are so weak.

1. Questioning the research question

My first set of comments relates to the definition of continuous disclosure as provided by the authors in the paper's abstract and the implications of this particular definition for the research design of the paper. Continuous disclosure is defined as "the immediate release of *material* information by issuers within a *regulatory* and information dissemination framework" (*italics added*). This definition suggests that the stock exchanges included in the analysis (and/or other regulators) *require* that *material* information items be disclosed. Therefore I am not convinced that the literature on voluntary disclosure is appropriate to motivate the hypotheses and the choice of the explanatory variables in this study. What is being investigated may well be (at least partially) mandatory disclosure. For example, disclosure about future acquisitions is often mandatory. Hence if the continuous disclosure measure includes acquisition disclosures, what is actually tested is not disclosure of acquisitions but the incidence of acquisitions. Unless there is no enforcement of disclosure rules, a model inspired by the voluntary disclosure literature will not work. And this is exactly what we see: lack of significance of many test variables in Tables 5, 6 and 7 of the paper. I believe that what is measured as continuous disclosure is the incidence of material events and not so much the decision to disclose these events.

Next comment relates to the concept of *materiality*. What makes information 'material' such that disclosure is required is often vague and may differ across institutional environments. Given prior analytical work about the impact of vague standards on behavior (see, for example, Willekens, Steele, Miltz, 1996), it is reasonable to expect that exchanges that provide clear guidance about what is considered to be material information will generate more compliance with the disclosure standard (as compared to exchanges that remain vague). In such environments (with clear materiality standards), continuous disclosure can be expected to be equivalent to mandatory disclosure. Given this reasoning and the argument put forward in the previous paragraph, the variation across disclosure rates between firms in the sample can be expected to be driven mainly by the characteristics of the securities exchange watchdog of a particular country, from which the data are drawn, and other factors that drive the incidence of a material event.

Related to the issue of vagueness and the quality of the securities exchange watchdog are the institutional differences between countries in general. Consideration of prior studies on the institutional differences between countries (see, for example, LaPorta, López de-Silanes, Shleifer, Vishny, 1998) are particularly relevant to the design and context of any study that includes observations from countries from different legal origins. No reference is made to that literature. Institutional differences, for example,

relate to the legal system, the quality of the enforcement mechanisms, investor protection and accounting systems (principles-based versus rules-based). These elements have a direct impact on disclosure behavior of firms and may explain the findings in this study better than the variables borrowed from the voluntary disclosure literature.

The authors do include country-specific variables in their disclosure model, but these variables almost tautologically absorb most of the variation in the disclosure measures, as can be seen from Tables 5 and 6. A vast majority of country parameters is statistically significant and the size of the country coefficients is substantial. In addition, inspection from Table 7, in which results are presented for five countries separately, reveals that the driving forces of continuous disclosure differ across all countries. This suggests that different disclosure models (as opposed to one general model as proposed) are describing continuous disclosure in different institutional environments.

2. More questions about the research design and the hypotheses

As mentioned above, the investigation of continuous disclosure is mainly motivated by the literature on frequency of (voluntary) disclosures. This also implies that very little is said about what is typical for continuous disclosures. Further, the authors do not explain why a model that is typically used for large cap firms is tested on a sample of small-cap firms. It is reasonable to expect that some forces that drive disclosure in general will also apply in the small-cap context, but there must also be forces that are typical for disclosure in a small-cap context and there may be forces that work in a large cap context that do not work in a small-cap context—another possible reason why some test variables turn out to be insignificant.

Nine hypotheses are formulated and tested, some of which are expressed as no-effect hypotheses. No distinction is made between different types of information disclosures in formulating these hypotheses; that is, all hypotheses are very generally formulated not only for all countries but also for all types of continuous disclosures that are investigated in this paper. This suggests that all types of disclosures are expected to be driven by the same variables. Another reasonable approach may be to distinguish between various types of disclosures and build hypotheses per type of disclosure, for example, distinguish between mandated and voluntary disclosures, or between disclosures about past or future events. In addition, no hypotheses are included to capture factors that would be typical for *continuous* disclosure in a *small-cap* context.

3. Some questions about variable measurement and data collection

The dependent variable in the continuous disclosure model that is proposed in the paper is the frequency of disclosure of online information items on the stock exchange websites. Manual collection of information items was done by various research assistants by coding “a detailed classification matrix.” Additional information about inter-rater consistency would be welcome. Lack of inter-rater consistency may generate noise in the data and may (at least partially) explain the insignificance of the test variables. Also, no

information is provided on how the dimensions of the dependent variable are identified and aggregated.

Measurement issues relating to the explanatory variables may also be a reason for the observed insignificance. First, in this study proprietary costs are measured through market concentration, in particular through the CR4 ratio. No motivation is provided why exactly the CR4 and not the CR6 ratio or Herfindahl index has been used to capture market concentration. In addition, although this measure is used in prior studies, it does not really indicate whether markets are *significantly* concentrated. An alternative measure for market concentration could be an indicator variable that equals one if a market is significantly concentrated and zero if not. Significance of market concentration can be easily assessed through tests developed in the Industrial Organization literature (see, for example, Parker, 1991¹). Second, some control variables seem to be missing from the model specification. I believe that a company size measure should also be included as the size range may still be considerable even in this small-cap sample². Prior evidence is generally consistent with a positive association between firm size and (the level of) voluntary disclosure (see, for example, Lang & Lundholm, 1993). Also, the issuance of new securities may be associated with disclosure behavior of firms in general. Prior studies report a positive association between securities issues and disclosure (see Lang & Lundholm, 1993).

4. Summary

This study is one of the first to construct and test a continuous disclosure model. The authors' manual data collection efforts of various types of continuous disclosure items are quite impressive: 12,673 announcements for 334 firms over a period of 15 months are identified. The results are however less impressive, as all but one test variable (information asymmetry) are statistically insignificant. Most of the variance in the disclosure data is explained by country variables. A challenge for future research on continuous disclosure is to build a model that is adapted to the institutional and regulatory environment in which it is tested, as well as to the different types of continuous disclosures that exist.

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¹ The basic idea of the method developed by Parker (1991) is to test whether a particular concentration ratio is significantly larger than a benchmark ratio that is being generated by a purely random allocation of market shares.

² No descriptive statistics on size are reported in the study.

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Reply

Reply to discussant's comments on "Firm specific determinants of continuous corporate disclosures"

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The points raised by the discussant with regards to our study are pertinent for the nature of research we have conducted. We addressed most of the discussants comments during the review process. We seem to have satisfied the discussant on several of the issues. However, some issues are contentious. Our discussion below addresses some of these concerns. The frequency and nature of the continuous forms of disclosure are new issues in the accounting and finance literature. Some of the concerns that the discussant raises will require future research to fully appreciate this phenomenon. We are confident that continuous disclosure will continue to be an important form of disclosure and the need for research on this class of disclosure will continue to grow.

The discussant refers to Tables 5, 6 and 7 of the paper. She questions the robustness of our research model. In particular, she draws attention to the statistics in Table 5 and states that all but one test variable (information asymmetry) are not statistically significant in the models presented. We have carefully reexamined this concern. When these three tables are seen together, the short window models (Table 6) show up as more robust than the long window models. Intuitively this is an appropriate outcome as the phenomenon we are examining is continuous in nature, i.e., short term in nature. The long window frequency measures seem to capture only the information asymmetry aspects of the financial environment, as the discussant has noted. We suggest that future research take note of the short term aspect of continuous forms of disclosure. Also, this indicates that, as hypothesized, the motivations for level of voluntary disclosure of the periodic form (tested in earlier studies) are also true for frequency of voluntary disclosure. In this respect, we did

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attempt to replicate the country by country tests of Table 7 on a short window basis. The results were weak due to the low frequency count for several countries when broken down into country by country analysis. Accordingly, we did not report these statistics.

The discussant is not convinced that the literature on voluntary disclosure is appropriate to motivate the hypotheses and the choice of the explanatory variables. She feels that what is being investigated may well be (at least partially) mandatory disclosure. This point of the discussant is fundamental to voluntary disclosure research. Many researchers in the past have claimed or implied that the disclosures they were studying were voluntary in nature. None of the studies that claimed to be of voluntary disclosure studies that we came across are completely free from mandatory biases. A measure of voluntary disclosure used in some of the studies, AIMR scores, are based on analysts' perceptions of total disclosures, not simply voluntary disclosures. A 2000 AIMR survey states that the survey is about "its members' attitudes toward and perceptions of corporate and financial disclosure among publicly traded companies" (AIMR, 2000, 8). The report does not mention the term voluntary disclosure. Yet many well cited studies used AIMR data as voluntary disclosure data and used voluntary disclosure theories to explain the level of AIMR scores of firms or their effects on market parameters. CIFAR scores (also used in prior voluntary disclosure studies) are based on both mandatory and voluntary disclosures. The well-known Botosan (1997) scoring system for voluntary disclosure was derived from the AIMR and CIFAR systems of measuring disclosure levels.

Since the issue of measurement of voluntary disclosure is important, we have attempted to address it in the paper. It is difficult if not impossible to provide a precise and universally accepted definition of voluntary disclosure. We have addressed the problem in three ways. First, we have highlighted the point that disclosures of the type that we are studying are only voluntary to a certain extent. Note that stock exchanges and or regulators only provide a general requirement that "material" information be disclosed. Except for some insider trading requirements and financial disclosures, they leave the final determination of what is material to the firms. Since items like insider trading disclosures and financial disclosures have specific or more stringent securities law requirements, we note that the frequencies for these types of disclosures are high. So, we rerun our tests by segmenting total disclosure into its main sub-categories. Initially we had considered using scoring systems such as that of Botosan (1997) to categorize the items. After matching the items on the voluntary disclosure indices found in the literature with those of actual online disclosures we realized that the two did not match very well.

The voluntary disclosure indices of past studies were constructed for annual reports and not for corporate announcements. This latter class of information tends to deal with information that may have an immediate price impact. Consequently they are often parsimonious. Conversely, annual reports are issued with more detail on individual items of disclosure. This comparison led us to believe that there were mainly four kinds of disclosures: Shares, Accounting, Prospective and Personnel, the first two being affected more by mandatory requirements and the second two being more voluntary in nature. Initially we had many smaller categories, but because of the small frequencies of many of these categories, they were merged into these four broad main categories. Our test results do show that the use of voluntary disclosure theories of the prior literature better explain Prospective and Personnel disclosures than Shares and Accounting disclosures.

Second, the international accounting literature suggests that there are numerous other variables, such as legal systems, culture, business financing, type of ownership and level of development, that affect continuous disclosure. We, therefore, deal with reporting environment influences, and this is done by using country dummies to control for country-based institutional influences.

Third, there are industry regulations and other industry related influences on voluntary disclosure. For this we use industry control variables. Since only financial firms were of the type that had different levels of disclosure from the rest, we reduced the number of industry dummies to a single dichotomous dummy to distinguish between financial and non-financial firms. This was sufficient for controlling industry effects.

The discussant also questions the measurement of continuous disclosure from another angle. She points out that the frequency of corporate announcements is the incidence of material events and not so much the decision to disclose about these events. The nature of company announcement is such that it has to be event driven. Companies tend to or are required to reveal material events and, if it can be estimated, disclose the consequences of such events. However, we have clarified in the paper and in the above discussion that in most circumstances it is up to the firms to decide the materiality of the event. Therefore, we do attempt to capture the incidence of the decision to disclose in our disclosure measure. Nevertheless, we also make additional arrangements to control the issue of frequency of material events. Firstly, since firm size could be a determinant of frequency of events, we control for size by selecting only small cap firms. We also ran tests for size effects and found no association between frequency of disclosure and size. We also use product cycle in our model to control for occurrence of material events. Product cycles can have two connotations. The first connotation is that firms with shorter product cycles would have more disclosures relating to the completion and sale of their products. The second connotation, running contrary to the first and similar to Butler, Kraft, and Weiss (2002) lack of transparency argument, would be that firms with longer product cycles would have to disclose more about their unfinished production activities to keep the market informed. Since we cannot infer a clear direction for the relation between frequency of disclosure and product cycle, we hypothesize a non-directional hypothesis for product cycle.

The discussant raises concerns about disclosures being driven by institutional variables and not by the voluntary disclosure determinants as we attempt to show. She points out that no reference is made to the literature that deals with the influence of institutional differences on reporting. She explains institutional differences relate to the legal system, the quality of the enforcement mechanisms, investor protection and accounting systems (principles-based versus rules-based). She argues that these elements have a direct impact on disclosure behavior of firms and may explain the findings in this study better than the variables borrowed from the voluntary disclosure literature. We do accept that there can be differences in institutional environments. In terms of online reporting requirements per se, there was limited variation between our selected exchanges. We decided to use all of these eight countries to have results that could be generalizable across countries that do have continuous disclosure arrangements. To control for what could be considered a myriad of securities law requirements we used country dummies. We do regard institutional differences as important reasons for disclosure levels, but we feel that it is too early to

conduct research using these notions for examining continuous disclosure activities as there are only a small number of countries that have adequately adopted continuous disclosure arrangements. Furthermore, the difficulty of hand collection of data may make a project including many countries cumbersome and costly.

Once again, with respect to the institutional differences, the discussant notes that a majority of country parameters are statistically significant and the size of the country coefficients is substantial. This, she indicates, suggests that different disclosure models (as opposed to one general model as proposed) are describing continuous disclosure in different institutional environments. We do disagree with this comment. Like most research issues there can be more than one research question to be asked and to answer each research question one may need a different research model. The country parameter issue is closely associated with the institutional issue dealt with above and it is not a simple issue. At the present time, with the information that we have, we believe that country variations are not because of different levels of requirements of online disclosure. We have noted through the process of data collection that the online disclosure requirements of our eight countries are very similar. The differences mainly occur because of the details of the various general disclosure requirements for disclosure of both financial and non-financial information. Some influence may also come from the general level of transparency in a country. These other country idiosyncrasies can have an indirect impact on the frequency of online disclosures. It is not the purpose of this study to examine these indirect impacts and therefore we used country dummies to control for country institutional and environment effects.

The discussant is concerned about inter-rater consistency. She feels that lack of inter-rater consistency may generate noise in the data and may (at least partially) explain the insignificance of the test variables. This research, being the first of its kind, required us to monitor the data collection process with great care. The scoring system was primarily a count of the frequency of announcements made on the stock exchange websites. Initially some thought was given to whether or not we should give weight to larger announcements. After observing the density and wide variation we decided to use a simple count and restrict our paper's focus on frequency of announcements rather than the size and quality of the announcements. The research assistants downloaded all the announcements in full. We decided to restrict our discussion to only the categorisation of the disclosures in terms of simple categories. These announcements were meticulously classified into the categories jointly by the researchers themselves. Therefore no concern for inter-rater reliability exists. For the frequency component, inter-rater reliability was primarily established through direct consultation between the researchers and research assistants. Also, substantial time was invested in training the data collectors at the start of the project.

The discussant points out that no motivation is provided for why the CR4 and not the CR6 ratio or Herfindahl index has been used to capture market concentration. Having read the literature on market concentration, we felt that CR4 is a commonly used measure of industry concentration. In the interest of parsimony, we decided not to describe CR4 and other competing forms in detail. In this regard, we cite a fairly recent and easily accessible paper, Butler et al. (2002), where this measure has been discussed in detail. We had considered the Herfindahl index in the early stages of this study, but we decided not to use it because a precise computation of this index would require the proportion of the market

share of all the firms within an industry. We used COMPUSTAT for procuring revenue and market share data. Since there were some firms with missing data, we resorted to the use of a broad measure such as CR4. CR4 requires a simple addition of proportions of the market share of each firm in an industry. Conversely the Herfindahl Index requires raising a firm's proportionate share to the power of two and then adding it to the squares of other firms' proportions. A missing data point in constructing the Herfindahl index can have a much larger impact on that index than it would have on CR4.

We do appreciate the suggestion for the use of alternative variables and measures. For some of the variables we did use alternative measures, however, for others we could not adopt alternatives because of missing data problem. In the case of availability of multiple measures, we decided to report the results of only those measures that we felt were more appropriate for the respective tests or that had more complete data sets. Because of the multiple measures for the dependent variable and to keep our tables readable, we decided to keep the number of alternative measures for the independent variables to generally one per variable.

We conclude by adding that we appreciate the discussants penetrating and inquiring discussion. Although it will be very challenging to address all her concerns in a single piece of research, the points raised will alert future researchers attempting to conduct continuous disclosure studies of the essential issues pertaining to this area of research.

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Book Review Section

The book review section is interested in works published in any language, as long as they are comparative or international in character. The author or publisher of such works should furnish the book review editor with two (2) copies of the work, including information about its price and the address where readers may write for copies. Reviews will be assigned by the book review editor. No unsolicited reviews will be accepted. Suggestions of works that might be reviewed are welcomed.

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Book reviews

International accounting: A user perspective

Shahrokh M. Saudagaran, *International accounting: a user perspective*, Second ed., Thomson South-Western, Ohio, 2004

International accounting is an increasingly important area of accounting. Business and capital markets are more widely dispersed around the globe than ever before. Consequently, the demand for cross-border financial information has correspondingly increased. Saudagaran's textbook, *International Accounting: A User Perspective*, describes international accounting issues for current and future business managers. Since the majority of business executives will be users of multinational financial information, not preparers of it, the book takes a user perspective to international financial reporting.

In response to recent concerns about the quality of financial reporting in many countries international financial reporting is receiving growing attention. The recent financial debacles at major multinational companies such as U.S.-based Enron, WorldCom, and Tyco drew global attention. Fraud and/or financial scandals have also occurred in companies elsewhere in the world, such as Canada's Bre-X Minerals, Netherlands' Ahold, and Japan's Daiwa Bank. Current and future business managers need to understand the related issues.

New in this second edition of the book is information about recent developments in the global-standard setting arena. Of particular note is information on the format and structure of the new International Accounting Standards Board. The book also covers the recent introduction of the new single currency, the Euro, in most European Union member countries.

The book presents the material completely, and succinctly in a writing style that is easy to read. As a result, the book fits between advanced accounting texts that have very little coverage of international accounting issues and very long traditional international accounting texts. The book has seven chapters: multinational financial reporting (Chapter 1: Interaction between accounting and its environment, diverse roles of accounting in countries, effects of diversity on capital markets, classification of financial accounting and reporting systems, and major challenges facing accounting globally); harmonization of international accounting standards (Chapter 2); currency exchange rate changes (Chapter 3: Foreign exchange exposure, exchange rate fluctuations, and foreign currency translation); selected financial reporting and disclosure issues (Chapter 4: Accounting for changing prices, accounting for goodwill and intangible assets, geographic segment reporting, and environmental and social disclosures); using corporate financial reports across borders (Chapter 5: Corporate responses to foreign users of financial statements).

coping with transnational financial reporting, international financial statement analysis); financial reporting in emerging capital markets (Chapter 6); and managerial issues (Chapter 7: Budgeting and performance evaluation, global risk management, transfer pricing and information technology).

Regarding end-of-chapter materials, each chapter ends with discussion questions, exercises, and sometimes cases. Web assignments are also provided. Discussion questions correspond to chapter materials. Many of the exercises involve practical evaluation of domestic and foreign annual reports. For the instructor's use, PowerPoint lecture outlines are provided for each chapter.

The strengths of *International Accounting: A User Perspective* are twofold. First, in a concise way, the book effectively covers the essential subjects of an international accounting class. Second, different from the average textbook, this book cites a great deal of scholarly research, which makes it a helpful reference book for the international accounting researcher. The weaknesses of the book stem from its strengths. First, the book may be too concise for some instructors—just seven chapters, and not all traditional topics are included. For example, given today's business environment, the book would have benefited from materials on business ethics and corporate social responsibility. Second, some students will not appreciate the way the author connects the book's topics to scholarly research. In many ways the book reads more like a research paper than a textbook. Thus, the strengths of the book are also its weaknesses.

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Christopher Humphrey, Bill Lee, (Eds.), *The Real Life Guide to Accounting Research — A Behind-the-Scenes View of Using Qualitative Research Methods*, Elsevier, Oxford, UK, 2004, 539 pp., (539 pages, USD 100, EUR 100, 0-08-043972-1)

1. General

This book is an unusual collection and I imagine it was a major project to coordinate. The editors, in fact, allude to what seems to me to have likely been a difficult process which clearly extended over a much longer time than appears to have been the original expectation. A number of features of the book are exceptional and perhaps extraordinary.

This is a very considerable tome, extending to 30 chapters and involving in all 46 authors. Other points to note are the variety of the contributions. The individual chapters vary greatly in interest, style, readability and authority. The book contains a number of chapters, which I consider to be gems, providing great insights on research for both experienced and novice researchers, alike. Some chapters will likely be of more help to new researchers, others to more experienced researchers, but some of the contributions are

a must read for both experienced and inexperienced researchers. This is not easy to achieve in unison.

The book consists of five sections:

1. the meaning of research
2. managing the research process
3. collecting and analyzing data
4. publishing and dissemination
5. interdisciplinary perspectives

Producing a worthwhile review of such an extensive and expansive text is difficult. By design the book is highly diverse. Qualitative research approaches cover a vast array of alternatives and when combined with the editors' aim to go behind the scenes to get personal stories of research experiences even more diversity is produced. In part, the result is an academic text which is far too diverse for me to recommend as the basis of a research methods course, but it certainly contains some must read material for budding researchers. The text is just too much and too big to face postgraduate students with. Although, I would also not feel comfortable recommending this entire book to postgraduates, there are notable contributions in each of the main sections that offer keys to understanding and applying qualitative approaches in accounting. I will pick out those that struck me as particularly valuable.

The book contains some remarkable contrasts which ought to help convince research students that the research journey is indeed a very personal experience. There are examples of these personal journeys in section one. I found myself completely enthralled reading Loft's chapter ("Nice Work: Writing a Ph.D. Thesis in Accounting"). For me the draw was not merely Loft's journey to Foucauldian enlightenment, though this is certainly extraordinary, but the folk tales of an array of researchers I have come to regard as legends of qualitative and critical research. Some begin to sound quite human in Loft's account. Loft somehow makes mundane her research experiences in an environment that seems to switch casually between the extreme loneliness of research and writing and interruptions occasioned by encounters with a veritable who's who of the authors who framed the 'critical' accounting project.

The theme of the research act as a personal journey, can be found in other sections. In section two Burns provides a highly anecdotal perspective on his early research path ("Confessions of a Research Assistant"). Burns describes the anxiety of differentiating his doctoral research from his work within a larger research project. He talks of the difficulties of finding an identity while acting as research assistant, doctoral student and lecturer. The context is so specific that it may not apply to many others, but readers might still draw interesting parallels with their own experiences.

At times it is not easy to see clearly the reason for one chapter being in one section rather than another. In many ways trying to impose sections goes against much of what some elements of qualitative research is about. Examples include chapter 17, in section three, where Ahrens delivers a carefully crafted and thoughtful piece on the nature of access and the alternative imperative of engaging with organizations (and presumably individuals) in more or less formal ways. Ahrens appears to argue that in some cases it is in the researcher's

interests and the interests of the research to avoid committing too early to highly detailed agreements as to what the researcher will do and what access he/she will be restricted to.

In section two Bédard and Gendron writing about their experiences of case research into the *modus operandi* of audit committees ("Qualitative Research on Accounting: Some Thoughts on What Occurs"), recount experience that adds to the advice we might take from Ahrens. Bédard and Gendron warn us against becoming too tied up with negotiations of access at the organizational level. They extol the virtues of informal access, of being able to approach individuals and develop access and their research questions gradually as they come to understand the research questions better. Bédard and Gendron argue, in opposition to conventional wisdom, that approaching individuals may produce better quality research access. They suggest that trying to arrange access at the level of the organization can often prove ineffective. There are shades of Ahrens in the experiences these authors recount.

Bédard and Gendron also give a good deal of emphasis to the requirements for ethical research practices in relation to both the research objects and the research funding bodies. I think it is clear that some research questions would be more amenable to the type of individual-research-object approach which these authors describe and in other instances an organization based approach may be necessary.

Lapsley also expresses concerns about access ("Making Sense of Interactions in an Investigation of Organizational Practices and Processes"), but has a rather different and perhaps controversial solution. In chapter 11, Lapsley takes concerns about the ethics of research and access to an extreme. He appears to argue in favor of covert studies of organizational environments by relating such an approach to that used in some types of clinical research. Lapsley's approach stands in marked contrast to the approach to ethics discussed by Bédard and Gendron, and seems to me to be a dangerous path to take qualitative research down.

A number of authors address issues of access and allude implicitly to the difficulty of balancing the expectations of both research participants and funding agencies. McSweeney, in chapter thirteen ("Critical Independence"), describes problems he experienced in balancing research and ethics while retained as a trade union advisor. He talks of the pressures on the individual of being in a 'fiduciary' relationship with a key player in the research environment.

In chapter 9 ("Management of a Research Team"), Broadbent and Laughlin give us as transparent an account of what middle range thinking means to the researcher and the research process as I have read previously. Their description of a very long association in a research team environment and with a particular methodology is informative and intriguing.

Section 3 titled "collecting and analyzing data," is the largest section of the book (ten chapters). I found the chapters in the section of mixed interest and, I think, quality. There are, however, some exceptional discussions in this section. For example, the Ahrens chapter I referred to earlier together with very different and distinctive pieces by Anderson-Gough ("Using Computer Assisted Qualitative Data Analysis Software: Respecting Voices within Data Management and Analysis") and O'Dwyer ("Qualitative Data Analysis: Illuminating a Process for Transforming a 'Messy' but 'Attractive' 'Nuisance'"). These authors provide excellent and detailed descriptions on aspects of data collection, manipulation, and the way in which they try to link to theory and identify themes. These are valuable contributions for

both new researchers and those more experienced writers and researchers who may wish to consider different qualitative techniques. O'Dwyer provides a brilliantly careful outline of his doctoral research project, giving a detailed account of the steps taken in data coding and interpretation. Anderson-Gough has produced an insightful and thoughtful contribution on "using computer assisted qualitative data analysis software."

My favorite chapter in this section is by Scapens ("Doing Case Study Research"). There is some commonality between Scapens and O'Dwyer in that one of the aspects which is particularly well illustrated by the former is the use of mind maps as a conceptual tool. Both authors refer to the use of such a tool as part of their ways of making sense of the vast amounts of research material produced in qualitative case studies. Scapens makes this technique come alive with some useful illustrative examples of mind maps he has used. He provides a wide-ranging treatise on case research, which is probably no surprise given his experience. Rather like the Ahrens contribution, Scapens produces an insightful contribution which seems to me to contain much common sense about carrying out qualitative research and working toward a case story. There is an interesting discussion of the pros and cons of taping research interviews that provides valuable reminders of some of the difficult choices faced by qualitative researchers. Scapens devotes a very convincing section to the use of the charts, diagrams, and the mind map approach. He uses the section in part to help emphasize the complexities of typical case research. This is one of the most practical sections in the book and well worth careful consideration. But the use of visual methods in the interpretation process is not without dangers. One of the cautions I would raise is that diagrams can be dangerous simplifications of the research context, potentially giving impetus to overly simple interpretations of complex settings. Diagrams can reveal but can also conceal, impacting on our thinking and ideas too heavily. Scapens suggest that charts and diagrams can be of immense value in the act of translating the research data into research story. He also provides a brief but instructive discussion of issues of writing up results, including those common difficulties encountered regularly in the review process of the authenticity and plausibility of the research story. This section of the chapter concludes with some interesting comments about the publication process in terms of what it means to have a theoretically informed case study.

This brings us to part four of the book which considers "publishing and dissemination." Here there are two very interesting contributions, chapters 24 and 25, from the editors of two well respected international journals, both of which publish a significant number of qualitative papers. The authors (Guthrie, Parker and Gray, "Requirements and Understandings for Publishing Academic Research: An Insider View" for *AAAJ*; Kari Lukka ("How Do Accounting Research Journals Function? Reflections from the Inside") for *EAR*) present good descriptions of the behind-the-scenes aspects of the academic journal submission and review process. Along the way they provide useful insights and advice for authors. Some of this advice might seem rather prosaic to experienced authors, but I certainly wish I'd not had to learn some of it by the trial and error route. This is again great value for new researchers and authors.

Part five of the text brings in "interdisciplinary perspectives." Here I found interesting insights into organizational psychology in chapter 29 ("Raising the Profile of Qualitative Methods in Organizational Research" by Cassell and Symon), but from my perspective the jewel in crown of the whole book is chapter 28 written by Harry Collins ("Qualitative

Methodology in Practice: My Experience"). I have to admit that this might again simply reflect personal biases as Collins is a founding father of the sociology of science studies, an area I have found of great interest. Collins provides a great escape from the depths of despair that many doctoral researchers often experience (see Loft in chapter six for a wonderfully happy ending but with some clearly excruciating moments). In contrast, Collins describes the, at times, fortuitous nature of the research environment. He argues how important it is "to stay light on your feet" and that "nearly every piece of fieldwork I have ever undertaken has turned to . . . disappointment. . . but when I decided that I must have been looking for something else all along, that something else, turned out to be much more interesting" (p. 488).

2. Conclusion

Given the seminal articles produced by Collins, this is a nice way to sum up some of the most interesting insights in this book for me. They are twofold: the excitement and unpredictability of the research process and the constant need to consider your options in relation to the research site and the questions you think you will be able to answer. Research must be planned and the researcher must be committed to the research process (if you like the quest for knowledge and understanding), but it is best not to fit oneself for a straightjacket too early.

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Christian Leuz, Dieter Pfaff, Anthony Hopwood (Eds.), *The Economics and Politics of Accounting — International Perspectives on Research Trends, Policy, and Practice*, Oxford University Press, Oxford, 2004 (404 pages, £58.00, ISBN: 0-19-926062-1)

The volume gathers together fifteen authoritative contributions, thanks to which it is possible to trace the trends in Accounting, assuming an international perspective and an original point of view, that of the economic and political dimensions.

The choice of referring to an international perspective allows for the delineation of the evolution of Accounting, concentrating on the great phenomena that have characterised the past few years and that promise to affect the very way of understanding the scientific area during the next few years. In this sense we can interpret some of the issues and proposals developed by the authors in the individual chapters, as in the case of fair value evaluations, or Goodwill's evaluation, or the transition to IAS/IFRS, or moreover the relationship between financial reporting and models of corporate governance. The topicality of the themes that are dealt with and the potentiality connected to their development are such to render them evident and to include how much future exists in

Accounting. The volume thus establishes a type of condensation of the potential areas of research for the next few years.

At the same time, the originality of the perspective that was taken in the selection and orientation of the different contributions in the volume must be noted. From the reflections proposed in each contribution, a clear and strong awareness emerges: accounting is much more than a scientific discipline characterised by technicality. It interacts deeply with the forces of economics and politics. An economic and political level of accounting exists which guides the strategic choices carried out both in the national sphere and more and more frequently in the international sphere. The comprehension of the technical solutions adopted for accounting, representation and evaluation within financial reports requires accounting scholars to descend into the examination of the forces that have guided the definition of accounting rules. In this sense, there is a need to develop knowledge and competence of the different and correlated fields (information economics, regulatory economics, sociology, and political science).

During the past few years, the concreteness and the actuality of the preceding affirmations has found wide confirmation. The need to supply credible, reliable and complete accounting (and not only accounting) information to the international capital markets has become more and more evident and the recent scandals have dramatically confirmed this. In this sense, the need for scientific contributions relative to the impact between economic and Accounting forces has become more and more important. At the same time, events such as the IASB reform, the agreement with IOSCO and the strategy developed by European Union constitute a clear proof of the interaction that exists between political and Accounting dimensions.

With reference to the importance evoked by the themes in examination, we must note the choice made by the Editors to dedicate the volume to the memory of the late Professor Dieter Ordelheide, who authored two of the contributions. The dedication of the volume to Dieter Ordelheide is a coherent testimonial because the perspective assumed in the volume and the originality of the themes confronted in the different contributions fully respond to the human and scientific depth of the illustrious Master. As is recalled in the preface of the volume, Dieter Ordelheide lived his university experience actively participating in the construction of a more European identity of the studies of Accounting, always assuming an international point of view with an elevated cultural depth. His involvement in the activities of the EIASM and EAA, and with the European Doctoral Colloquium, and his participation in numerous research networks on the European level have left a deep impression. As it is possible to read in one of the contributions in this volume, Dieter Ordelheide considered Accounting to be a scientific discipline characterized by solid conceptualisations, strongly structured by the interaction with the socio-economic context, and necessarily rooted in history. The different contributions offered in this volume, which includes a series of scholars that have shared academic activities, research projects and scientific collaborations with Ordelheide, adhere to this formulation.

In the case of volumes that gather different contributions linked to a theme of reference, there is always the risk of a certain disharmony or dissonance among the many formulations proposed in each contribution. The emergence of this situation could be connected to the construction of a volume which follows the realisation of the individual contributions. In the specific case of this volume, the sensation that it is possible to perceive in the pages of the

presentation of the study, in the organisation of the same, and in the development of specific contributions is that of a unity of the project. In the book, the different authors seem to share the same pressure to consider Accounting as an area that is inevitably influenced by factors and forces of an economic and political nature.

Beginning with this conviction, the volume was structured in three parts, within which specific sections are identified. In the first part of the volume, the theme of the interactions between economics and Accounting, or rather the role that Accounting plays in the economic processes, are developed. In particular, they have tried to illustrate the impact of economic research in financial accounting with particular reference to the problems of information asymmetry or conflicts of interest (Alfred Wagenhofer). In the section relative to the problems of Equity evaluation they point out, moreover, the contributions developed regarding the utilisation of evaluations at fair values in the preparation of Financial Statements (Michael Bromwich), as well as the informative limitations that these evaluations can manifest (Wolfgang Ballwieser). In the first part, further contributions were offered with reference to the problems that Accounting encounters with respect to the theme of measuring performance (Dieter Pfaff), and with respect to the relationship between Accounting and corporate governance (Ray Ball).

The focus of the second part was, however, placed on the examination of themes that regard accounting regulation and the problems of enforcement, with particular reference to the recommendations that the literature and empirical research conducted can allow us to deduce in order to steer strategic and operative choices of the standards setters, on both an international and a national level. Relative to the themes of accounting regulation, problems connected to evaluation in terms of costs and benefits of regulations that provide a major or minor disclosure of information in annual accounts were examined (Robert E. Verrecchia). The theme of disclosure was, furthermore, addressed in empirical terms with reference to voluntary disclosure in Germany (Christian Leuz). An area of study that is strictly correlated to that of the definition of accounting regulations is that of the instruments and the forms that allow them to be put into practice, or rather, enforcement. From this point of view, the contributions made reference to the problems of the application of US GAAP on Goodwill (these deal with SFAS 142 and FASB) within the German accounting scene (Walther Busse von Colbe), or the problems connected with the application (again in the German scenario) of international accounting standards relative to the drafting of the Cash Flow Statement (Günther Gebhardt and Aaron Heilmann), or the problems connected to the correct utilisation of accounting regulations from the point of view of auditors within the scenario following the Enron disaster (Ralf Ewert).

In the third and last part of the volume, themes that manifest the political character inherent in Accounting, or rather the political forces and choices that intervene in the definition of the regulations that technically determine or influence the process of the preparation of annual accounts, were confronted. In this perspective, the role of Accounting in society and in the formation of the phenomenon of lobbying was investigated. Within this sphere, a posthumous contribution by Dieter Ordelheide was published, in which the recently deceased scholar had defined the Framework of the Politics of Accounting. The contributions regarding the study of the phenomena of lobbying and their impact on the development of accounting regulations for the annual accounts in the particular German scenario (Stuart McLeay, Dieter Ordelheide and Steven Young), or rather that regarded the

issuance process of a regulation of law examined, making reference to the case of Austria (Stuart McLeay and Doris Merkl) are tied to this framework. A further area of investigation within the sphere of the Politics of Accounting considered the vast and very current theme of the processes of the issuance of the International Accounting Standards. This theme was, in the case of the volume in examination, observed from the point of view of the difficult relationship between the European Directives in accounting matters and International Accounting Standards (Karel van Hulle), as well as the role that academics have, or could have, in the definition of the politics of development of Accounting, moving, in this case, from an analysis comparing England and Germany (Michael Power).

A reading of the different contributions offered in the volume allows us to reconstruct an original and complete vision of Accounting. Original, in the sense that from it, it is possible to appreciate a focus on a series of themes that are still less noted in literature and certainly projected toward the near future. Complete, in the sense that the volume was defined as a structure that covers the different currents that tie Accounting to the economic and political dimensions.

On the whole, the themes were addressed by following a formulation in which contributions of the institutional and regulatory type, as well as those of an analytical and empirical type, were given space. All was developed with a methodological rigor and originality of contents that clearly emerge from all of the contributions. It could have been nothing less, considering the authoritativeness of the majority of the academics that participated in the elaboration of the scientific project and in the preparation of the volume. The perspective of the international context and regarding the specific national scenarios examined was broad, although the reference to the international scenario and that of the different Countries which compose the European context could have been broader.

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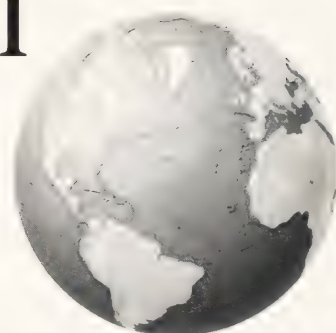
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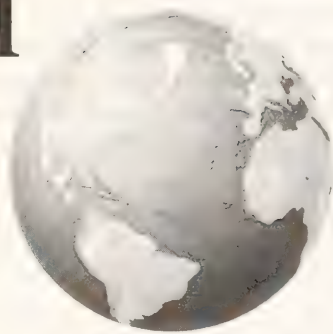


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Audit effort and fees under concentrated client ownership: Evidence from four international audit firms[☆]

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Abstract

Using proprietary audit hour and fee data from the internal records of four Big Six firms in Finland, this study examines the influence of audit client ownership type on audit effort and fees. The primary argument is that there are differential effects of ownership concentration depending on the particular nature of concentrated ownership (i.e., firms in which the majority of shares are manager-owned versus foreign-owned versus state-owned). Consistent with this, the paper documents that audit hours and fees are lower for companies majority-owned by their management and higher for subsidiaries of foreign companies than for other firms. However, no difference between companies owned by the state or municipalities and companies with a more diverse ownership structure can be found. This suggests that governmental ownership is actually closer to a dispersed than a concentrated ownership structure in terms of audit quality.

The results show that replacing the variable indicating majority-ownership with the variables capturing the type of a controlling owner increases the explanatory power of the models significantly, which demonstrates the importance of ownership type in the production and pricing of an audit. The findings have important implications for those examining audit markets with client firms owned by different types of controlling shareholders.

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Keywords: Audit fees; Audit costs; Audit effort; Audit production; Ownership structure; Managerial ownership

The earlier draft of this paper, entitled as "Client's ownership type as a determinant of audit effort and audit fee: Evidence from Finland", received the Best Paper Award at the 2001 European Research Network Symposium held in Wuppertal, Germany.

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Various client risks include the degree of the financial statement user's reliance on the statements, the new client–auditor relationship (Helliar, Monroe, & Woodliff, 1996), and the probability of financial distress (Pratt & Stice, 1994; Stice, 1991). To capture these client risks, following prior research, indicator variables for listed companies (LISTED), new client relationships (NEW CLIENT), and loss-making (LOSS) are employed, respectively. For audit hours, the expected signs for these three variables are assumed to be positive. However, for audit fees, competition over new clients and poor profitability may create downward pressure (Butterworth & Houghton, 1995; Simon & Francis, 1988; Taylor & Baker, 1981). Due to the possible opposite effects of new client relationships and loss making on audit fees, no prediction for fees is presented for NEW CLIENT and LOSS.

Finally, systematic differences in audit fees may exist among the different audit firms. For example, Price Waterhouse has been found to charge higher fees in many countries (e.g. Moizer, 1997). To control for the possible pricing or effort differences between Price Waterhouse and the other audit firms, an indicator variable (PW) was added to the model.

6. Sample selection and descriptive statistics

6.1. Sample selection

This study focuses on the audits of large clients of (then) Big Six audit firms in Finland, excluding financial and insurance companies. Limiting the analysis to Big Six audits should reduce the possible impact of national idiosyncrasies as the very idea of being a global brand name supplier is to provide the same goods or services in every country. Consequently, focusing on Big Six audits should further improve the comparability of the results to other countries.

The client companies were identified by comparing Statistics Finland's database of the large Finnish firms with data on the auditors of large and medium-sized Finnish companies produced by Balance Consulting Ltd. After deleting observations for companies with joint auditors, there were 502 potential companies. A sample of 200 client companies was randomly drawn from the list. I then contacted the audit firms for these 200 companies to collect the data on audit fees and audit hours from fiscal year 1996. Four of the Big Six firms provided access to their internal billing records.⁶

The proprietary data describing the ownership type of an audit client were hand collected from Suomen Asiakastieto Oy-Finska (a major credit-analyst firm in Finland) files. The database lists the names of members of the board of directors and of major owners of firms for almost all unlisted Finnish firms, which allowed the identification of the indirect owners.⁷ The companies are classified as (1) companies owned and controlled

⁶ In addition, one audit firm provided audit fees and hours, but not the identities of their clients. These data could not be used in this study.

⁷ The audit of a single firm as a unit of analysis causes the measurement problem of the ownership structure. For example, seemingly similar cases in the sense of direct ownership, a fully owned subsidiary of a multinational firm and a fully owned subsidiary of the group controlled and owned by its management are clearly very different ownership types. Thus, in addition to direct ownership, indirect ownership also has to be taken into account.

Table 2
Sample firms by industry

Industry	Frequency	Percent
Manufacturing	28	34.57
Trade	33	40.74
Mining	2	2.47
Construction	2	2.47
Post and telecommunications	2	2.47
Services	4	4.94
Transport	2	2.47
Computer and computer-related activities	2	2.47
Holding companies	4	4.94
Other	2	2.47
Total sample	81	100.00

by their managers (e.g., family businesses), (2) companies owned by the state or municipalities, (3) companies owned by foreign companies, or (4) companies with no majority owners (comparison group). In cases of missing or unclear data, the information needed was gathered from the firm's web pages or directly from the company's management by phone or email. Combining all these sources of data resulted in the sample of 103 observations.

Financial statement data were obtained from the Voitto+ database. Missing data on the length of the auditor–client relationship (NEW CLIENT) reduced further the final sample size to 81 observations. Table 2 provides a breakdown of the sample firms by industry.

Table 3
Descriptive statistics

Continuous variables	Mean	S.D.
FEE (1000 FIMs)	134.55	154.79
LN FEE	4.42	1.14
AUDIT HOURS	319.77	384.59
LN HOURS	5.27	1.21
TOTAL ASSETS (million FIMs)	748.22	1536.14
LN ASSETS	12.52	1.36
INVREC	0.35	0.22
Binary variables	Percentage ^a	Number ^a
PARENT	33.33	27
LISTED	9.88	8
NEW CLIENT	7.41	6
LOSS	24.69	20
PW	18.50	15
MAJORO	74.10	60
STATEO	7.41	6
MANO	24.69	20
FORO	41.98	34

Variable descriptions are found in Table 1.

Sample size, $n=81$.

^a Where value of variable = 1.

concentration and fees. The same relationship, however, could not be found with Norwegian data (Firth, 1997).

In sum, our understanding about the relationship between the ownership structure of the audit client and audit production and fees is limited. Moreover, there is a lack of research on the influence or the existence of non-managerial majority shareholders on audit production and fees, despite the calls for research on this particular issue (Hay et al., 2003, p.24).

3. Auditing in Finland

Finland provides a good setting for a Continental European study as the Finnish institutional setting resembles those in other Continental European countries in three important ways: concentrated corporate ownership (Faccio & Lang, 2002), legal systems based on code law (LaPorta et al., 1998; Wymeersch, 1998), and relatively low auditors' exposure to litigation risk (Vander Bauwhede, Willekens, & Gaeremynck, 2003).

In Finland, the principles of financial reporting are stipulated in the Accounting Act and the Company Law, and the Auditing Act specifies the rules and regulations in auditing.¹ As a member state of the European Union, Finland has the obligation to ensure that the Finnish audit regulations comply with the Directives of the European Commission (Finland joined the EU in 1995). In Finland, these directives are implemented through the Auditing Act (936/1994), which defines the purpose and scope of a statutory audit and, requires "full" financial statement audits (i.e. reviews or other assurance services providing limited assurance are not an option). In addition to opining on the fairness of the financial statements, auditors must also give an opinion regarding the profit distribution suggestions made by the board of directors, and an opinion as to whether a client's management has complied with all applicable laws and company by-laws (Auditing Act 936/94, Chapter 4, Subsection 19).

Although the Auditing Act specifies the principles of auditing and regulates the profession, it provides limited practical guidance on financial statement audits. Since the Finnish certified auditors' professional organizations are members of the International Federation of Accountants (IFAC), certified auditors in Finland must also follow the International Standards on Auditing (ISA). Together, these standards provide a lower bound of audit quality attributable to the profession.

Similar to many Continental European countries, such as some Nordic countries, Germany, and Italy, the certification of public accountants in Finland is characterized by a two-tier system. Auditors approved by the Central Chamber of Commerce (KHT) are regarded as "first tier" auditors whereas the "second tier" certified accountants (HTM) are approved by regional Chambers of Commerce. In general, both the prerequisites and the KHT certification exam itself are regarded as more demanding than the qualifications needed to become an HTM auditor. The largest companies and

¹ For a description of Finnish accounting and auditing laws, see Sundgren and Johansson (2004: 126–127).

all the listed companies operating in Finland are required by law to hire a KHT auditor whereas the clients of the HTM auditors are mainly small and medium-sized companies (Niemi, 2004).²

In Finland, three features in the legal system mitigate against auditor litigation (Niemi, 2002). First, legal awards are limited to the actual loss of the plaintiff (i.e., they have no punitive aspect). Second, the professional body of attorneys prohibits contingent-fee-based billing. Third, class-action lawsuits are not possible. Consequently, the auditor's litigation exposure should be lower in Finland than in countries that allow class actions and higher awards. To support the assertion that Finland is a country with relatively low litigation pressures, I turned to a leading insurance brokerage firm that maintains a proprietary litigation index for purposes of pricing insurance premiums for large international accounting firms.³ The index ranges from 0 to 10 in order of increasing litigation pressure and is maintained and updated annually for 110 countries. For the audit period in question, the index shows Finland in the upper quartile of the lower half of the range.⁴

4. Hypothesis development

4.1. *The scope of an audit and the demand for assurance*

The scope of an audit and the demand for assurance that accounting numbers are fairly presented are the two general determinants of audit effort. The scope of the audit is determined by the number of different information and reporting systems used by the audit client, the number of transactions in those systems, and the amount and nature of financial information disclosed by the client management. The level of assurance delivered by the audit is understood in the audit literature as the probability that the financial statements are free from material error after they have been audited. The demand for this assurance emerges from information asymmetries between client management and stakeholders of the client firm and also from the legal environment in which the client firm operates. The main argument of the paper is that there are differential effects of ownership concentration depending on the particular nature of concentrated ownership (i.e., firms in which the majority of shares are manager-owned versus foreign-owned versus state-owned) on audit production and pricing through the two dimensions of an audit, the scope of the audit, and the demand for assurance.

² In addition to the two tiers of *certified* public accountants, there is also a "third tier" of suppliers of audit services, persons holding no certificate. Non-certified persons are allowed to audit companies and partnerships that are so small that according to the EU Directives they could be exempt from having a statutory audit but are required to be audited according to the Auditing Act. Nevertheless, the requirements of audit quality stipulated in the Auditing Act are the same for all. Anyone providing a statutory audit is required to have a sufficient level of skills and knowledge in accounting and legislation to conduct the audit given its level of complexity.

³ I wish to thank Prof. Mark Taylor and Aon Insurance Services for providing the information.

⁴ The firm disallowed reporting of the actual index for any of the countries.

4.2. Three types of controlling owners

Studies on corporate ownership show that the most common type of a controlling owner is a manager-owner or a “founding family,” that participates in daily operations of the corporation (e.g., LaPorta et al., 1999). This is also the case in Continental European countries including Finland (Faccio & Lang, 2002). Another typical controlling owner is the state or municipalities. According to LaPorta et al. (1999: 496), 70% of the largest traded firms in Austria, 45% in Singapore, and 40% in Israel and Italy are state controlled. A third common type is corporate ownership (Wymeersch, 1998). Subsidiaries of MNCs with overseas headquarters are major players in many industries, especially in smaller economies. These three types of ownership structures have unique characteristics. The differences arise from the relationship between management and the controlling owner. Consequently, these differences are expected to have differential effects on auditing as discussed below.

4.2.1. Managerial ownership

Information asymmetry between the owners and managers in manager-owned firms should be lower than in other forms of ownership, which should lead to a lower demand for assurance. Empirical support for this argument is provided by the auditor choice literature, which links the higher probability of choosing a higher quality auditor to situations characterized by higher information asymmetry between owners and managers (e.g. Beatty, 1989; DeFond, 1992; Francis & Wilson, 1988). This finding is consistent with the view that the higher the managerial ownership, the lower the demand for assurance because owners are more actively engaged in day-to-day operations. Also, manager-owners might be more efficient in controlling corporate assets than hired managers, resulting in a less hierarchical organizational structure. This lower organizational complexity should also reduce the demand for assurance (Abdel-Khalik, 1993) and the scope of the audit. Third, a manager that has a large share of his wealth invested in the company is likely more risk averse in making investment decisions than the manager who has a more diversified portfolio (Jensen, 1986). The management's risk-taking behavior should have an impact on audit effort through the auditor's risk assessment.

In sum, manager-owned firms are expected to be characterized by lower information asymmetry, lower organizational complexity, and lower auditor risk, which should result in lower audit effort and fees. These expectations are formalized as H1:

H1. Audit hours and fees are lower for companies where a majority of shares is owned by its management than for other companies.

4.2.2. Foreign-owned subsidiaries

Prior empirical evidence suggests that multinationals report their results in more detail than companies operating in only one country (Jaggi & Low, 2000). Since more detail requires more effort to audit, such audits reflect higher fees (Karim & Moizer, 1996; Rose, 1999). Similarly, audit fees should be higher for the subsidiaries of foreign companies than their domestically owned counterparts because of added

financial reporting complexity and the greater need for corporate governance in foreign owned subsidiaries. Producing financial statements is likely to be more complex when a parent company is located in another country because the accounting rules differ across countries. As each subsidiary is obviously responsible for producing its own financial statements for consolidated accounts at the group level, a subsidiary operating in a different country than its parent company must produce at least one additional set of financial statements. Moreover, these additional sets of financial statements may be prepared in multiple languages requiring additional effort. Lastly, financial reporting of overseas affiliates requires foreign currency transformations and transfer pricing.

Foreign affiliates may also require additional controls over management because the conflict of interest between the management of the subsidiary and the foreign corporate owner may be magnified by geographical distance and national objectives (Buckley, 1997: 204). As in all related companies, the owners are concerned with suboptimization (i.e., a subsidiary taking action that is beneficial to its own objectives but not optimal for the organization as a whole), but in multinational corporations this monitoring problem is likely exacerbated by the geographical separation. The managers may favor the perceived interests of their national subsidiary rather than the overall interests of the firm. Consequently, the need for management control may be higher in foreign-owned subsidiaries than in domestically owned subsidiaries. Thus, the additional complexities in financial statement reporting and the problems of management control in foreign-owned subsidiaries likely increases the need for more extensive auditing procedures. These expectations are formalized in H2:

H2. Audit hours and fees for companies that are foreign affiliates are higher than for other companies.

4.2.3. Governmental ownership

Governmental ownership differs from the other forms of ownership. Denis and McConnell (2003: 4) describe such ownership as a hybrid of dispersed and concentrated ownership. On the one hand, state-owned corporations are ultimately financed with money that belongs to the people of the state, and in this regard the ultimate ownership is extremely dispersed. This creates a more pronounced free-rider problem than in large listed companies with a diffuse ownership structure, where the shareholders have no strong incentive to directly monitor the management themselves because each shareholder has only a small investment in the firm (Berle & Means, 1932). On the other hand, the *de facto* control rights, in practice, are in the hands of the individuals within the government (Shleifer & Vishny, 1997).

But unlike other types of controlling owners, the government representatives have no cash flow rights. Even so, they have an incentive to monitor the management as they may suffer reputation costs if they fail to monitor management effectively. More important, the fact that the individuals within the government do not bear the controlling (auditing) costs themselves should have an impact on their own cost benefit analysis, which should, from the individual's point of view, shift the optimum amount of external auditing upwards. This should result in a larger investment in auditing in state-owned companies compared

to those companies with insiders bearing the cost of auditing.⁵ These expectations are formalized in H3:

H3. Audit hours and fees are higher for state-owned companies than for other companies.

5. Research design

5.1. Combined ownership concentration (preliminary test)

Chan et al. (1993) hypothesized and documented an inverse association between ownership concentration and audit fees with the sample of large listed U.K. companies. They combined managerial ownership and any holdings exceeding 5%. Firth (1997) used the same measure in his fee study focusing on Norwegian listed companies but found no association between concentrated ownership structure and fees. For comparison, the associations between ownership concentration (having a majority-owner) and audit effort and fees are examined two versions of the following:

$$\begin{aligned} \text{LN}(Y) = & \alpha_0 + \alpha_1 \text{LNASSETS} + \alpha_2 \text{INVREC} + \alpha_3 \text{PARENT} + \alpha_4 \text{LISTED} \\ & + \alpha_5 \text{NEW CLIENT} + \alpha_6 \text{LOSS} + \alpha_7 \text{PW} + \alpha_8 \text{MAJORO} + v \end{aligned} \quad (1)$$

where Y is the total audit fees (LNFEES) for Model 1, and the total audit hours (LNHOURS) for Model 2. The explanatory variables are as defined in Table 1. The variable of main interest, MAJORO is an indicator variable for a company that is majority-owned.

5.2. Different types of controlling owners (the main test)

As a main test, the association between the levels of audit fees and hours and the hypothesized fee determinants are examined by estimating two versions of the following regression:

$$\begin{aligned} \text{LN}(Y) = & \beta_0 + \beta_1 \text{LNASSETS} + \beta_2 \text{INVREC} + \beta_3 \text{PARENT} + \beta_4 \text{LISTED} \\ & + \beta_5 \text{NEW CLIENT} + \beta_6 \text{LOSS} + \beta_7 \text{PW} + \beta_8 \text{STATEO} \\ & + \beta_9 \text{MANO} + \beta_{10} \text{FORO} + v \end{aligned} \quad (2)$$

where Y is the total audit fees (LNFEES) for Model 3, and the total audit hours (LNHOURS) for Model 4. The explanatory variables are as defined in Table 1. To test the hypotheses of the study, the three ownership variables (MANO, FORO, STATEO) are included in both regression models. These three variables of interest are dummies indicating if the client is a company in which the majority of shares are owned by the company's management (MANO), a foreign (parent) company (FORO), or the state or

⁵ For discussion about the incentives of different parties influencing the demand for auditing in a more general context, see Hay and Knechel (2003).

Table 1
Description of variables

Variable name	Expected sign fees/hours	Description
<i>Dependent</i>		
LNFEES (Models 1 and 3)		Natural logarithm of total audit fee
LNHOURS (Models 2 and 4)		Natural logarithm of total audit hours charged to the audit engagement
<i>Independent</i>		
LNASSETS	+/+	Natural logarithm of the client's total assets
INVREC	+/+	Proportion of the client's assets in inventories and receivables
PARENT	+/+	Binary, 1=the client is a parent company, 0 otherwise
LISTED	+/+	Binary, 1=the client's shares were publicly held in 1996, 0 otherwise
NEW CLIENT	?/+	Binary, 1=the auditor client relationship is 2 years or less, 0 otherwise
LOSS	?/+	Binary, 1=the client incurred a loss in the any of the last 3 fiscal years, 0 otherwise
PW	+/+	Binary, 1=the client of Price Waterhouse, 0 otherwise
MAJORO (Models 1 and 2)	?/?	Binary, 1=the majority of the client company's shares is owned by the State or municipalities, its management, or a foreign company, 0 otherwise
STATEO (Models 3 and 4)	+/+	Binary, 1=the majority of the client company's shares is owned by the State or municipalities, 0 otherwise
MANO (Models 3 and 4)	-/-	Binary, 1=the majority of the client company's shares is owned by its management, 0 otherwise
FORO (Models 3 and 4)	+/+	Binary, 1=the client is a subsidiary of a foreign company, 0 otherwise

municipalities (STATEO), respectively. The negative coefficient for MANO supports H1 and the positive coefficients for FORO and STATEO support H2 and H3, respectively.

5.3. Control variables

The prior audit fee modeling work shows that major fee determinants include client size, complexity of client operations, various client risks, and the supplier of the audit (Chan et al., 1993; Cobbin, 2002; Hay et al., 2003; Walker & Johnson, 1996). The typical measure of client size in the previous models, the natural logarithm of total assets (LNASSETS) is adopted in this study. Following prior works, the ratio of inventories and receivables to total assets (INVREC) is employed to capture one aspect of the complexity of the audit client. Another aspect of complexity, the number of accounting systems, should increase with the number of subsidiaries if the audit effort were measured at the group level. In this study, since the effort and fees are measured at the individual company level, the similar relationship cannot be assumed. Even so, audits of parent companies can be assumed to be more laborious than subsidiaries or "independent" companies because the auditor of the parent company also has to audit the consolidated financial statements (the Accounting Act). Consequently, a variable indicating when the client is a parent company (PARENT) is employed.

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Finally, systematic differences in audit fees may exist among the different audit firms. For example, Price Waterhouse has been found to charge higher fees in many countries (e.g. Moizer, 1997). To control for the possible pricing or effort differences between Price Waterhouse and the other audit firms, an indicator variable (PW) was added to the model.

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STATEO	7.41	6
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FORO	41.98	34

Variable descriptions are found in Table 1.

Sample size, $n=81$.

^a Where value of variable = 1.

Table 4
Pearson (Spearman) correlations below (above) the diagonal for independent variables^a

	LNASSETS	INVREC	PARENT	LISTED	NEW CLIENT	LOSS	PW	MAJORO	MANO	FORO	STATEO
LNASSETS	1	-0.516*	0.341*	0.365*	-0.173	0.062	-0.181	-0.330*	-0.195	-0.254*	0.246*
INVREC	-0.549*	1	-0.346*	-0.310*	0.240*	-0.078	0.097	0.225*	0.170	0.235*	-0.347*
PARENT	0.397*	-0.319*	1	0.468*	-0.200	-0.101	0.000	0.418*	0.142	-0.495*	0.000
LISTED	0.439*	-0.297*	0.468*	1	-0.094	-0.094	-0.158	-0.560*	-0.190	-0.282*	-0.094
NEWCLIENT	-0.174	0.265*	-0.200	-0.094	1	0.166	-0.013	0.167	0.057	0.142	-0.080
LOSS	0.035	-0.079	-0.101	-0.094	0.166	1	-0.052	0.012	-0.129	0.151	-0.053
PW	-0.180	0.089	0.000	-0.158	-0.013	-0.052	1	0.282*	-0.052	0.367*	-0.135
MAJORO	-0.391*	0.196	-0.148*	-0.560*	0.167	0.012	0.282	1	0.339*	0.503*	0.167
MANO	-0.221*	0.169	-0.142	-0.190	0.057	-0.129	-0.052	0.339*	1	-0.487*	-0.162
FORO	-0.278*	0.203	-0.495*	-0.282*	0.142	0.151	0.367*	0.503*	-0.487*	1	-0.241*
STATEO	0.235*	-0.333*	0.000	-0.094	-0.080	-0.053	-0.135	0.167	-0.162	-0.241*	1

^a Variable descriptions are found in Table 1.

* p value < .05 for correlation coefficient.

6.2. Descriptive statistics

Table 3, which presents the descriptive statistics of the 81 sample companies, shows that the average fee is 134,000 Finnish Markkas (27,000 USD) and an engagement takes an average of about 320 h. When comparing the average fees and hours to previous studies it should be noted that the empirical tests performed in this paper are based on audits of single companies, not on groups of companies. This level of analysis is chosen as it allows the examination of the subsidiaries of foreign companies. Sixty (74%) companies out of 81 are majority-owned; 34 (42%) are subsidiaries of foreign companies, 20 (25%) are owner-managed companies, and six (7%) are state-owned companies. Eight (10%) sample firms are listed companies, leaving 13 privately held companies with no majority owners.

6.3. Correlations between the independent variables

Table 4 presents the correlations between independent variables. The highest correlations (-0.560) are between listing status (LISTED) and the ownership concentration dummy (MAJORO), and between client size (LNASSETS) and the ratio of inventories and receivables to total assets (INVREC), a proxy for complexity of client operations (-0.549). The values of correlation coefficients exceeding 0.8 are interpreted as indicating significant multicollinearity problems (Judge, Hill, Griffiths, Lütkepohl, & Lee, 1988: 868). As all the values of correlation coefficients are well below 0.8, they do not suggest that multicollinearity is a serious problem.

7. Results

7.1. Combined managerial and non-managerial concentration (the preliminary test)

As a preliminary test, motivated by Chan et al. (1993), the differences in audit fees and hours between companies with majority owners and companies with a more diverse ownership structure were examined. The results of this preliminary test are reported in Table 5 (Models 1 and 2). As the measure of the combined managerial and non-managerial ownership concentration (MAJORO) is insignificant in both Models 1 and 2, the results do not support the idea that ownership concentration per se impacts audit effort or fees. The finding is not surprising if managerial and non-managerial ownership concentration have opposite effects on auditing as hypothesized.

The positive PW indicator variable in both Models 1 and 2 ($p < 0.005$ and $p < 0.010$, respectively) suggests that the audits of Price Waterhouse are larger, resulting in higher fees. The negative NEW CLIENT variables indicate that not only fees, but also audit hours are lower for the initial audits.

7.2. Effects of the different types of the majority owners (the main test)

As a main test, the regression models above were re-estimated after replacing MAJORO with the three separate indicator variables MANO, FORO, and STATEO.

Table 5

Test of differences in audit fees and audit hours between majority-owned companies (MAJORO) and companies with no majority owners

Dependent variable		Model 1 (audit fees)				Model 2 (audit hours)			
		LNFEES				LNHOURS			
Independent variable ^a	Expected sign (Model 1/Model 2)	Coefficient	<i>t</i> statistic	<i>p</i> value*	VIF	Coefficient	<i>t</i> statistic	<i>p</i> value*	VIF
Constant		−2.591	−1.842	0.070		−1.115	−0.719	0.475	
LNASSETS	+/+	0.524	5.241	0.000	1.738	0.475	4.308	0.000	1.738
INVREC	+/+	0.802	1.349	0.091	1.561	0.773	1.180	0.121	1.561
PARENT	+/+	0.095	0.357	0.356	1.489	0.108	0.372	0.356	1.489
LISTED	+/+	−0.024	−0.053	0.479	1.739	−0.106	−0.212	0.416	1.739
NEW CLIENT	?/+	−0.843	−2.010	0.048	1.154	−1.137	−2.459	0.008	1.154
LOSS	?/+	0.433	1.759	0.083	1.077	0.593	2.185	0.016	1.077
PW	+/+	0.666	2.383	0.005	1.129	0.736	2.388	0.010	1.129
MAJORO	? ?	−0.027	−0.088	0.930	1.708	−0.072	−0.216	0.830	1.708
Sample size, <i>n</i> = 81									
Adj. <i>R</i> ²			0.351			0.302			
<i>F</i> statistic			6.404			5.320			
Significance of <i>F</i> statistic			0.000			0.000			

^a Variable descriptions are found in Table 1.

* Significance of *p* value based on one- (two-) tail *t*-test when (no) a priori prediction is made.

Table 6 shows that consistent with H1 stating that audit hours and fees are lower for management owned companies, the coefficient on MANO is negative and significant for both audit fees and hours ($p < 0.020$ and $p < 0.010$, respectively). The results are also consistent with H2, as audit fees and hours of companies that are foreign affiliates are higher than other companies as shown by the positive coefficient on FORO ($p < 0.043$ and $p < 0.039$). The results are not consistent with H3. Audit hours and fees are not higher for the state-owned companies than for other companies. On the contrary, the results on STATEO suggest that companies owned by the state or municipalities do not differ from those with non-majority owners.

The regression coefficient estimates of the test variables MANO and FORO reported in Table 6 translate to the relative differences in audit fee and hour levels as follows. Owner managed firms (MANO) have around 47% lower fees and 55% lower hours, on average, than the comparison group (i.e., companies that are not majority owned). Correspondingly, foreign-owned subsidiaries have 70% higher fees and 84% higher hours on average than the comparison group.⁸

⁸ However, due to relatively wide confidence intervals (not reported) for true coefficients the estimated multitudes of differences in fees and hours should be interpreted with caution.

Table 6

Test of differences in audit fees and audit hours between companies owned by the management, a foreign corporation, the state or municipalities, and other companies

Dependent variable		Model 3 (audit fees)				Model 4 (audit hours)			
		LNFEF				LNHOURS			
Independent variable ^a	Expected sign (Model 3/ Model 4)	Coefficient	<i>t</i> statistic	<i>p</i> value*	VIF	Coefficient	<i>t</i> statistic	<i>p</i> value*	VIF
Constant		-2.183	-1.722	0.089		-0.668	-0.488	0.627	
LNASSETS	+/+	0.470	5.145	0.000	1.815	0.415	4.205	0.000	1.815
INVREC	+/+	1.063	1.924	0.029	1.690	1.046	1.752	0.042	1.690
PARENT	+/+	0.605	2.297	0.013	1.852	0.716	2.517	0.007	1.852
LISTED	+/+	-0.190	-0.463	0.323	1.804	-0.319	-0.718	0.238	1.804
NEW CLIENT	?/+	-0.811	-2.165	0.034	1.155	-1.100	-2.718	0.004	1.155
LOSS	?/+	0.315	1.406	0.164	1.119	0.446	1.842	0.035	1.119
PW	+/+	0.339	1.261	0.106	1.306	0.334	1.151	0.127	1.306
MANO	-/-	-0.644	-2.101	0.020	2.098	-0.791	-2.389	0.010	2.098
FORO	+/+	0.531	1.688	0.043	2.889	0.608	1.792	0.039	2.889
STATEO	+/+	0.432	0.997	0.161	1.546	0.387	0.828	0.205	1.546
Sample size, <i>n</i> = 81									
Adj. <i>R</i> ²			0.482			0.466			
<i>F</i> statistic			8.441			7.969			
Significance of <i>F</i> statistic			0.000			0.000			

^a Variable descriptions are found in Table 1.

* Significance of *p* value based on one- (two-) tail *t*-test when (no) *a priori* prediction is made.

The results on the NEW CLIENT variable remained qualitatively the same as those in the preliminary test: the negative coefficient on NEW CLIENT suggests that fees and, unexpectedly, also audit hours are lower for initial audits ($p < 0.034$ and $p < 0.004$, respectively). The comparison of the results for the PW indicator variable between the preliminary test and the main test (Tables 5 and 6), however, warrants further examination. The PW indicator variable, which was found positive and significant for both audit fees and hours in the preliminary test ($p < 0.005$ and $p < 0.010$, respectively), lacks statistical significance in the main test. To exclude the possibility that the PW clients drive the results supporting the hypotheses, the PW clients (15) were removed from the sample and the models were re-estimated. As Table 7 shows, the results remained qualitatively the same, which increases the confidence for the documented support for the hypotheses.

7.3. Diagnostics and sensitivity checks

Based on standard diagnostics for the appropriateness of the ordinary least squares (OLS) method performed, any problems in applying the OLS method in tests of the hypotheses could not be found.⁹ Multicollinearity does not seem to be a serious problem

Table 7

Test of differences in audit fees and audit hours between companies owned by the management, a foreign corporation, the state or municipalities, and other companies when the clients of price waterhouse are removed from the sample

Dependent variable		Model 5 (audit fees)					Model 6 (audit hours)			
		LNFEES					LNHOURS			
Independent variable ^a	Expected sign (Model 5/Model 6)	Coefficient	<i>t</i> statistic	<i>p</i> value*	VIF		Coefficient	<i>t</i> statistic	<i>p</i> value*	VIF
Constant		-2.541	-1.599	0.115			-1.339	-0.768	0.446	
LNASSETS	+/+	0.480	4.153	0.000	2.232	0.451	3.557	0.000	2.232	
INVREC	+/+	1.529	2.105	0.020	2.006	1.566	1.965	0.027	2.006	
PARENT	+/+	0.754	2.299	0.013	2.053	0.799	2.218	0.015	2.053	
LISTED	+/+	-0.197	-0.444	0.329	1.790	-0.324	-0.667	0.254	1.790	
NEW CLIENT	?/+	-1.059	-2.410	0.019	1.161	-1.367	-2.833	0.003	1.161	
LOSS	?/+	0.301	1.126	0.265	1.169	0.390	1.330	0.094	1.169	
MANO	-/-	-0.667	-1.974	0.027	1.873	-0.810	-2.185	0.017	1.873	
FORO	+/+	0.652	1.904	0.031	2.234	0.724	1.927	0.030	2.234	
STATEO	+/+	0.560	1.185	0.120	1.585	0.495	0.954	0.172	1.585	
Sample size, <i>n</i> = 66										
Adj. <i>R</i> ²			0.492				0.467			
<i>F</i> statistic			7.984				7.329			
Significance of <i>F</i> statistic			0.000				0.000			

^a Variable descriptions are found in Table 1.

* Significance of *p* value based on one- (two-) tail *t*-test when (no) a priori prediction is made.

either: the correlation coefficients between independent variables (Table 4) are moderate, most independent variables have statistically significant regression coefficients, and the Variance Inflator Factor scores reported with the regression results (Tables 5 and 6) are well below the threshold of ten that is perceived to indicate serious multicollinearity (Neter, Wasserman, & Kutner, 1983).¹⁰

The sensitivity checks on the results to alternative model specifications, however, are warranted, as only a limited amount of work is done in European countries and the choice of variables has been based more on experimenting and prior empirical findings than formal theory. First, total assets were replaced by other proxies for client size, total net sales and number of personnel. While these size variables were somewhat less correlated

¹⁰ The distributions of the residuals from the models were examined using the Kolmogorov–Smirnov test. The assumption of normality could not be rejected. To examine the possible heteroskedasticity problems the Goldfeld–Quandt test was performed. The Goldfeld–Quandt test should be more efficient than for example, White's general test of heteroskedasticity in cases in which one can identify the source of potential heteroskedasticity problems (Greene, 1997: 551). Often the source of potential problems is related to the firm size: if error terms are not constant they are likely to increase with the firm size. The Goldfeld–Quandt test based on this assumption revealed no heteroskedasticity problems.

¹¹ In the context of audit fee models, a fairly thorough analysis of multicollinearity is found in Taylor & Simon (1999: 385).

with some other control variables, such as the ratio of inventories and receivables to total assets (INVREC), the overall model fit was lower. Otherwise, the results remained qualitatively the same.

Second, various alternative measures of complexity of client's operations and the audit risk related to the client's financial distress were considered. Complexity was measured by the number of industries the client operates in and the number of locations the client has. Financial distress measure, the indicator variable for loss making, was replaced with alternative continuous measures of leverage and profitability.

Third, to reduce the risk that correlated, omitted variables drive the results, some variables were added to the model. Following Chan et al. (1993), the location of the client was considered using a dummy that indicates if the client is located in the Helsinki area, where living costs are higher than in the other parts of Finland. Also, using an indicator variable approach, the effects of the "busy season" (Chan et al., 1993), and of having an internal audit department (Felix, Gramling, & Maletta, 2001; Jensen & Payne, 2003; Simunic, 1980) on audit hours and fees were examined. Possible differences in audit production, reflecting differences in the clients' industries, were examined using two industry indicator variables (manufacturing and trade). Also, to control for the possible differences between audit firms more carefully, two firm dummies were added. Although controlling for individual audit firms reduced somewhat the significance levels for *FORO* in both Models, *FORO* remained significant at the 10% level (one-tail test). As none of these dummy variables were statistically significant, and, more importantly, the results remained qualitatively the same in these alternative model specifications, the variables were removed for parsimony from the reported models.

Finally, an alternative sample was used to address the problems that might arise from the potential classification error of ownership types. This classification error is more likely to occur for publicly held firms than for privately held companies, as the ownership type of listed companies in some cases might be less clear than that of private companies. Namely, it may be that in some public companies the largest blockholders are quite influential even if they are not majority owners. This is possible, for example, when the blockholders are the managers of the company. In those cases, the actual ownership type might resemble a management-owned company rather than a company with a more diverse ownership structure. On the contrary, privately held firms typically have either a very concentrated ownership structure or a very diffuse owner base (for example, mutual fund companies that are owned by their customers or members). Consequently, all listed firms (8) were removed from the sample and the regressions were re-estimated. As the results remained qualitatively the same using this alternative sample, the potential misclassification error of ownership type of the listed companies does not seem to be a serious problem.

8. Conclusion

The paper argues that the effect of the ownership concentration on audit effort and pricing depends on the owner type. Consistent with this, the results show that, compared to other firms, audit effort and fees are lower for the companies majority-owned by their

management and higher for the subsidiaries of foreign companies. However, no difference between companies owned by the state or municipalities and companies with more diverse ownership structure was found, suggesting that governmental ownership, a hybrid of dispersed and concentrated ownership (Denis & McConnell, 2003, 4), is closer to dispersed than concentrated ownership in terms of audit quality.

The finding that the impact of having a controlling owner depends on the type warrants extra care for controlling for differences in ownership types. This is especially important when examining markets characterized with a broad variety of different ownership types such as those in Continental European countries.

The findings also demonstrate that the failure to control for ownership type may lead to incorrect conclusions. To illustrate, the results from the preliminary tests based on the models including only the measure of combined managerial and non-managerial ownership concentration indicated clear differences in audit hours and fees between Price Waterhouse and the other three Big Six audit firms used in this study. However, after controlling for different types of majority-owners, statistically significant differences between audit firms could not be found.

A relatively small sample size can be regarded as a limitation of this study. Also, the study is limited to the audits of the four Big Six (then) firms that allowed access to their internal billing records. It may be possible that the other audit firms behave differently. On the other hand, limiting the analysis to Big Six audits should reduce the possible impact of national idiosyncrasies, since the very idea of being a global brand name supplier is to provide the same goods or services in every country. Consequently, focusing on Big Six audits should further improve the comparability of the results to other countries.

Future research is needed to evaluate the generality of the results. For example, cross-country studies could examine the influence of institutional differences on the relationship between client's ownership structures and audit production. Audit production and functioning of the markets for audit services in countries with concentrated ownership structure is still largely unexplored terrain.

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Why do national GAAP differ from IAS? The role of culture

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Abstract

In this paper, we investigate the role of culture as an explanatory factor underlying differences between national GAAP and International Accounting Standards (IAS). National GAAP can differ from IAS in two ways: (1) divergence: both national GAAP and IAS cover a specific accounting topic but prescribe different methods; or (2) absence: national GAAP do not cover an accounting issue regulated by IAS. Based on Nobes' [Nobes, C. (Ed.) (2001). *Gaap 2001 – A Survey of National Accounting Rules Benchmarked Against International Accounting Standards*. IFAD.] data, we construct a measure for the level of divergence of national GAAP benchmarked on IAS. We also create a measure (labeled absence) to assess the scope of national accounting rules compared to IAS. Our sample is made up of 52 countries. We show that culture matters more than legal origin (common law/civil-law) in explaining divergences from IAS. This result is robust to two proxies for culture: Hofstede [Hofstede, G. (2001). *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*. Second. Sage Publications (London).] and Schwartz [Schwartz, S. H. (1994). Beyond individualism/collectivism: New cultural dimensions of values. In U. Kim, H. C. Triandis, C. Kagitcibasi, S. C. Choi, & G. Yoon (Eds.), *Individualism and collectivism: Theory, method and applications* (85119). Sage.] Our findings contribute to the ongoing debate on accounting harmonization. More specifically, they suggest that the technical and/or political dimensions of the debate, although essential, are not the only ones involved. Opposition to IAS is not exclusively driven by contractual motives, a claimed technical superiority, or legal origin, but also by diversity in cultural factors. Another contribution of this paper is the

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development of a two-dimensional score to measure the differences between national GAAP and IAS.

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1. Introduction

The importance of international accounting harmonization is now widely accepted for several reasons. First, the rapid development of international capital markets is strengthening their dominant role as an economic resource distributor. How information is disclosed to the market is a central issue in ensuring market efficiency. Second, the increasingly frequent cross-listing of multinationals generates an urgent need for a single universal set of accounting standards for these firms in order to reduce information production costs and send out a unified, reliable message to the market. Third, the activities of institutional investors are becoming increasingly internationalized. Their presence in foreign markets is forcing domestic listed firms to play the accounting game by global rules.

As a legitimate pretender to the role of global GAAP, International Accounting Standards (IAS in the rest of the paper) (renamed International Financial Reporting Standards (IFRS) from 2001) have been growing in fame since the endorsement in 2000 of the Comparability Project by the IOSCO and the reform in 2001 that saw the IASC become the IASB. In June 2002, the European Union decided to make IAS compulsory for the consolidated accounts of all its listed companies from 2005 (European Union, 2002). This decision was followed by the introduction of similar policies in Russia, Australia, and New Zealand. In October 2002, the FASB and IASB issued a memorandum of understanding, marking a significant step towards formalizing their commitment to the convergence of U.S. and international accounting standards. However, not all countries are traveling down the road of convergence towards IAS at the same speed. The domestic accounting standards of the “slower” countries often cover fewer issues than the IAS.

There are two ways that a national GAAP system can differ from IAS: (1) *divergence*: both national GAAP and IAS cover a specific accounting topic but prescribe different methods; or (2) *absence*: national GAAP does not cover an accounting issue regulated by IAS. Conformity is easily understood in this context, but how can we explain the remaining differences (i.e. divergence or absence), especially in 2001, after several decades of development of IAS? In this paper, we investigate the role of a country's cultural values and legal origin in explaining the differences between national GAAP and IAS as of 2001.

Based on the study of “GAAP 2001” (Nobes, 2001) conducted by several international accounting firms, 62 countries are assigned scores according to their divergence from IAS and the absence of national accounting standards on issues covered by IAS. Note that our measures are created on the basis of 2001 data. This allows us to analyze the “true” *divergence* and *absence* indexes, as these differences are observed before the date of mandatory application of IAS in certain regions (e.g. 2005 for the European Union and Australia).

We then analyze the relationship between these accounting harmonization scores and cultural values, as assessed with reference to the work of Hofstede (1980, 1991, 2001) and Schwartz (1994). Another possible approach would have been to investigate the influence of institutional/economic factors on our measures. However, since recent literature in economics and finance (Greif, 1994; Landes, 2000; Stulz & Williamson, 2003) demonstrates that culture is a determinant of institutions, this article stresses the importance of cultural rather than institutional factors.

For more comprehensive coverage of the issue, we also integrate institutional factors into our model, in the form of legal origin, which proxies for various economic/institutional factors (La Porta, Lopez-de-Silanes, Shleiffer, & Vishny, 1998). In particular, as past research identified significant links between accounting disclosures and legal systems (Jaggi & Low, 2000; Hope, 2003), we hypothesize significant differences of approach to the IAS between two sub-samples: code-law countries and common-law countries.

We find that cultural values matter more than legal origin in explaining divergence from IAS. However, with regard to the absence index, we find no significant relationship, and legal origin does not appear to have any influence on divergence from IAS or absence of local standards. These results contribute to the existing literature in two ways: the relationship between culture and international accounting harmonization has not been studied previously, and although legal origin is usually considered as an explanatory variable for accounting information (Ball, Kothari, & Robin, 2000), this does not seem to be the case for accounting regulation in the context of international accounting harmonization.

This research will be valuable not only for understanding the current differences between IAS and national GAAP, but also for predicting the potential difficulties facing various countries in the move towards future international accounting harmonization. The rest of the paper proceeds as follows. Section 2 provides a review of the literature on international accounting differences and describes the measurement tool we used. Section 3 analyzes the relationship between culture and accounting, and lays out our hypotheses. Section 4 explains our research design and measurement of independent variables. Section 5 analyzes the empirical findings, Section 6 presents the limitations of this study, and Section 7 concludes the paper.

2. International accounting differences

2.1. Past research on measurement of international accounting differences

In the literature, various data sources have been used to measure international accounting differences. During the 1970s, Price Waterhouse International (1973, 1975, 1979) published a series of studies on accounting principles and reporting practices worldwide. In 1973, the survey covered 233 principles and practices in 38 countries. The 1975 survey constitutes a better data source, with eight additional countries and 264 principles and practices covered. The sample in both studies is biased toward Western countries, and leaving certain areas of the world under-represented. The 1979 survey extended further to cover 64 countries. These surveys were used in several international

accounting studies (e.g. Douppnik & Taylor, 1985; Frank, 1979; McKinnon & Janell, 1984; Nair & Frank, 1980, 1981), all of which focus on accounting requirements and standards.

Other studies (Emenyonu & Gray, 1996; Evans & Taylor, 1982; Murphy, 2000; Nobes, 1987; van der Tas, 1988) are more interested in company reporting practices. Tay and Parker (1990) review several of these studies (see also van der Tas, 1992).

In their study on the accounting disclosure requirements of 35 stock exchanges throughout the world, Adhikari and Tondkar (1992) developed another tool to measure international accounting differences. They developed a composite disclosure index to measure the overall quantity and intensity of compulsory disclosures (44 information items, financial and non-financial) in the listing and filing requirements of different stock exchanges. The main limitation of their index for measuring international differences is that it covers disclosures only in annual reports.

After summarizing the information on accounting practices in 15 countries (various European countries, the U.S., Canada, Australia, and Japan) plus IAS, Ordelheide and Semler (1995) proposed the TRANSACC Reference Matrix. Each country's complete accounting rules are presented in tabular form and the rules on any particular accounting issue are shown for all the countries covered by TRANSACC. Accordingly, the matrix covers those rules that determine the content of the balance sheet and income statement, including recognition and valuation as well as the consolidation methods applied in the respective countries. It provides information on each accounting method under review in the following form: R (required), A (allowed), F (forbidden). Ordelheide and Semler's study provides a comprehensive examination of different accounting methods, but is restricted to the most developed countries in the world. In subsequent literature, several studies have used this matrix to classify countries according to their accounting differences (e.g. d'Arcy, 2001).

More recently, Ashbaugh and Pincus (2001) sought to determine whether the variation in accounting standards across national boundaries relative to IAS had an impact on financial analysts' ability to forecast the earnings of non-U.S. firms' accurately. They analyzed accounting practices in 13 countries to identify differences in countries' accounting standards relative to IAS, covering both differences in disclosure requirements and measurement methods for IAS versus sample firms' domestic GAAP in 1993.

To conclude, there is room for improvement in the existing measurements for international accounting differences. Some of them are out of date (Price Waterhouse International, 1973, 1975, 1979); others concern only a limited number of countries (Ashbaugh & Pincus, 2001; Ordelheide & Semler, 1995), cover only a selection of accounting issues (Adhikari & Tondkar, 1992), or deal with measurement of accounting differences on a corporate reporting basis (Emenyonu & Gray, 1996; Evans & Taylor, 1982; van der Tas, 1988).

2.2. Measuring a country's accounting harmonization

We obtain our data on differences and similarities between national GAAP and IAS from "GAAP 2001: A Survey of National Accounting Rules Benchmarked against International Accounting Standards" published by Andersen, BDO, Deloitte Touche Tohmatsu, Ernst and Young, Grant Thornton, KPMG and PricewaterhouseCoopers (Nobes, 2001).

In this study, “partners in the large accountancy firms in more than 60 countries” [62 countries, to be precise] were asked to “benchmark their local written requirements against some 80 accounting measures, focusing on standards (both IAS and national) in force for the financial reporting period ending 31 December 2001. The resulting high level summaries were prepared by identifying, for the selected accounting measures, those instances in which a country would not allow (because of inconsistent requirements) or would not require (because of missing or permissive requirements) the IAS treatment.” By using 2001 data to create our measures, we can analyze the “true” *divergence* and *absence* indexes, since these differences occur before the date of mandatory application IAS in certain regions (e.g. the required adoption in 2005 for the European Union and Australia).

For each country, the accounting differences with IAS are listed in four categories:

- (1) “accounting may differ from that required by IAS because of the absence of specific rules on recognition and measurement,”
- (2) “no specific rules requiring disclosures,”
- (3) “inconsistencies between” national “and IAS rules that could lead to differences for many enterprises in certain areas,”
- (4) “in certain enterprises, these other issues could lead to differences from IAS.”

Appendix A shows the results of the survey concerning one sample-country: Australia. We found ourselves confronted by several methodological issues. The result of the survey is “negatively” organized in the sense that it only includes “absent” or “inconsistent” items. Items that are “in conformity” or “present” or “consistent” are not disclosed (see Appendix A). Because it was crucial to identify these items for the purposes of this paper, we referred to the survey questionnaire, presented in GAAP 2001 (p. 149–161). Appendix B presents the first two questions as an illustration. This questionnaire has 79 questions. The only way to identify “in conformity” items was to take all the questions from the questionnaire and search for the related item and/or IAS paragraph in the survey’s results (see Appendix A). We then assumed that an item related to a question not covered in the results was an “in conformity” item. This brought us to realize that the order of questions in the questionnaire and the order of items mentioned in the results were not always consistent. Additionally, some topics listed in the results did not correspond exactly to a question: for instance, some questions were split into two items.

We therefore matched the questions and results country by country. It was then decided to create a comprehensive list of items, comprising all items found in both the results and the questions. We identified 111 items (starting from the initial 79 questions in the questionnaire).

With this list of items, for each country we were able to prepare the following codification, concentrating on differences:

Code	Meaning
A	Absence of specific rules on recognition and measurement
B	No specific rules requiring disclosures
C	Inconsistencies that could lead to differences for many enterprises
D	Differences in some enterprises

As we found that the distinction was not always clear-cut between categories C (differences for many enterprises) and D (differences in certain enterprises), we merged them. As categories A and B refer to the absence of rules (recognition/measurement or disclosures), we also merged these two categories.

Our final classifications were thus as follows:

Code	Meaning
1	Divergence: inconsistencies that could lead to differences for many or some enterprises
2	Absence: of specific rules on recognition/measurement or disclosure

The score per country for each category is determined by the number of accounting items included in the categories. In all, 62 countries' national GAAP were studied, but only a maximum of 52 are presented in this study due to the availability of data concerning our independent variables: Hofstede's cultural dimensions. Using Schwartz's (1994) value types (see below) leads to a restricted sample of 32 countries.

Table 1 presents the divergence/absence/conformity scores for the 52 countries studied (both present in our IAS database and in Hofstede's sample). Of the 111 items identified in IAS, on average, 21 are divergent from national rules, 24 are absent from national principles, and 66 are in conformity.

We then conducted an analysis by IAS. For each item we compute the number of countries where local rules were divergent (divergence), less comprehensive (absence), different (absence or divergence) or equivalent to IASB rules. Since we have 52 countries in our sample, the total score for all three dimensions (divergence, absence, and conformity) equals 52. We then aggregate items for each IAS. For example, three items relate to IAS 1. The sum of the scores is thus 156 ($=52 \times 3$). Since the number of items per IAS is not constant (three items for IAS 1, as mentioned, 5 items for IAS

Table 1

Divergence, absence, difference and conformity scores for the 52 countries studied

	Divergence (1)	Absence (2)	Difference (A = 1 + 2)	Conformity (B, as a check)	Total (A + B)
Mean	21	24	45	66	111
SD	9	15	18	18	0
Minimum	0	0	0	31	111
Percentile 25%	14	13	34	52	111
Median	21	23	43	68	111
Percentile 75%	28	33	59	77	111
Maximum	38	56	80	111	111

Our two indexes of differences (*divergence* and *absence*) are based on the study of 111 IAS items for 52 countries. For a given country, *divergence* is the number of items (out of 111) for which national GAAP and IAS diverge (prescription of different solutions to the same problem). *Absence* is the number of items absent in national GAAP compared to IAS (items covered in IAS but not in national GAAP). *Difference* is the sum of *divergence* and *absence*. *Conformity* is the addition of 111 dummy variables coded 1 if local rules and IAS are identical (111 items studied). *Total* is the sum of *conformity* and *difference*.

2, etc.), we present the percentage of items divergent, absent, different or in conformity compared to IAS. Going back to the example of IAS 1, we found no countries with diverging standards, 29 with absent items and 127 with items in conformity (total: 156). The corresponding percentages are 0%, 19% ($=29/156$) and 81% ($=127/156$). We interpret this percentage as an aggregate measure of divergence/absence/difference/conformity of local standards with regard to a given IAS. For instance, national standards are 81% in conformity with IAS 1. Table 2 presents the results by IAS.

Table 2 shows that the four most harmonized accounting standards are “inflation adjustment,” “associates,” “joint ventures,” and “tangible assets,” while the four least harmonized accounting standards are “discontinuing operations,” “financial instruments: recognition and measurement,” “employee benefits,” and “financial instruments.” Interestingly, these international accounting differences exist for various reasons. For “discontinuing operations” and “employee benefits,” the difference mainly arises from the lack of relevant accounting standards in many countries; financial instruments, on the other hand, are a major area of international divergence because many nations take different approaches from IAS.

Table 2
Level of divergence/absence/difference/conformity of national GAAP relative to IAS

IAS	Related theme	Divergence (1) [%]	Absence (2) [%]	Difference (= 1 + 2) [%]	Conformity (3) [%]
1	Presentation of financial statements	0	19	19	81
2	Inventories	25	8	33	67
7	Cash flow statements	14	25	39	61
8	Extraordinary items	31	15	46	54
10	Post-balance-sheet events	20	4	24	76
11	Construction contracts	37	10	46	54
12	Deferred tax	31	22	53	47
14	Segment information	9	43	52	48
16	Tangible fixed assets	15	2	17	83
17	Leases	20	23	43	57
19	Employee benefits	18	52	70	30
20	Government grants	12	8	19	81
21	Foreign currency translations	17	10	27	73
22	Business combinations	18	14	32	68
24	Related parties	0	27	27	73
27	Consolidated subsidiaries	17	4	21	79
28	Associates	10	4	13	87
29	Inflation adjustment	6	7	13	88
31	Joint ventures	4	12	15	85
32	Financial instruments	30	39	69	31
33	Earnings per share	10	35	44	56
35	Discontinuing operations	17	65	83	17
36	Impairment of assets	14	34	48	52
37	Provisions and contingencies	21	18	38	62
38	Intangible assets and goodwill	20	12	31	69
39	Financial instruments: recognition and measurement	45	27	72	28
40	Investment property	16	26	42	58

3. How does culture influence accounting?

In this section, we briefly describe how cultural issues have been introduced into international accounting research, with reference first to Hofstede's cultural dimensions model (Hofstede, 1980, 1991, 2001), then the conception of accounting values by Gray (1988). We also discuss the cultural dimensions of values, introduced more recently by Schwartz (1994). Finally, we present our hypotheses.

3.1. Hofstede's cultural dimensions model

"Culture is defined as collective programming of the mind; it manifests itself not only in values, but in more superficial ways: in symbols, heroes, and rituals" (Hofstede, 2001, p. 1). Based on an attitude survey of IBM employees in 66 countries during the 1970s, Hofstede developed country-based indices corresponding to four dimensions of national culture for each country surveyed. With the help of this model, cultural differences and their consequences between nations, societies, and regions can be described in detail. Here are the definitions of these key dimensions.

Power distance: The extent to which the less powerful members of society accept that power is unequally distributed.

Individualism: In individualistic societies there are few ties beyond those of the nuclear family, whereas in collectivist societies people belong to strong, cohesive in-groups.

Masculinity: In "masculine" societies men are assertive, tough, and concerned with material success, whereas women are more modest, tender, and interested in the quality of life. In 'feminine' societies, both are equally concerned with quality of life.

Uncertainty avoidance: The extent to which people feel threatened by uncertain or unknown situations. This is expressed in a need for formality, predictability, and clear rules.

This cultural dimensions model has been challenged by several researchers (Bond, 1988; Smith, Dugan, & Trompenaars, 1996). For example, Smith et al. (1996) examined the replicability of Hofstede's methodologies. They raised the following question: did Hofstede's measures reflect the Western values of those who designed them? Hofstede had addressed this issue by undertaking a Chinese Value Survey (Hofstede & Bond, 1988), subsequent to which a further dimension, "Long-Term Orientation" (also named "Confucian Dynamism"), was introduced.

Long-term orientation: The extent to which people favor a pragmatic, future-oriented perspective-fostering virtues like perseverance and thrift-over short-term thinking.

Appendix C shows the scores for the first four dimensions for the 52 countries surveyed, the "long-term orientation" dimension being disregarded in this study because data are only available for a limited number of countries (23). For example, the United States scores 91 on *Individualism* and Guatemala six, reflecting the fact that the United States is highly individualistic and Guatemala very collectivist.

Although Hofstede's cultural dimensions model has been criticized in the literature (Baskerville, 2003; Gemon & Wallace, 1995; Hofstede, 2002, 2003; McSweeney, 2002a,b), it is extensively used in business-related (including accounting) research and psychological research (Sondergaard, 1994). Gemon and Wallace (1995) reviewed issues

and problems in the application of Hofstede's cultural dimensions. They described cultural studies in international accounting research as "trapped by a paradigm myopia by its reliance on the framework suggested by Hofstede" (p. 85), partly because Hofstede's survey was limited to one organization and may not be applicable to other contexts. Baskerville (2003) argued that "the embeddedness of the four dimensions in the social, political or economic measures indicates that the dimensions identified by Hofstede describe characteristics of different nations, most of which could be identified as socio-economic in origin."

Another possible criticism of Hofstede's approach is that the IBM data are now old and therefore obsolete. However, in his new edition of "Culture's consequences," Hofstede (2001, p. 73) argued that the dimensions found were assumed to have centuries-old roots. Furthermore, only data that remained stable across his two subsequent surveys were retained. Since 1980, Hofstede's cultural dimensions have been validated against other external measurements and recent replications show no loss of validity (Barkema & Vermeulen, 1997; Hoppe, 1990; Sondergaard, 1994; van Oudenhoven, 2001).

3.2. Gray's accounting values

It was Gray (1988) who made the major contribution of introducing Hofstede's cultural dimensions into accounting. Based on Hofstede's model, he developed four accounting values:

Professionalism versus statutory control: A preference for the exercise of individual professional judgment and the maintenance of professional self-regulation as opposed to compliance with prescriptive legal requirements and statutory control.

Uniformity versus flexibility: A preference for the enforcement of uniform accounting practices between companies and for the consistent use of such practices over time as opposed to flexibility in accordance with the perceived circumstances of individual companies.

Conservatism versus optimism: A preference for a cautious approach to measurement so as to cope with the uncertainty of future events as opposed to a more optimistic, laissez-faire, risk-taking approach.

Secrecy versus transparency: A preference for confidentiality and the restriction of disclosure of information about the business only to those who are closely involved with its management and financing as opposed to a more transparent, open, and publicly accountable approach.

Gray (1988) sets out to link his accounting values to Hofstede's cultural dimensions. Following this proposition, a number of empirical research papers attempted to find empirical evidence on this topic, and the Hofstede-Gray framework was strengthened and enhanced by other studies (Belkaoui, 1989; Chow, Chau, & Gray, 1995; Hussein, 1996; Perera, 1989; Perera & Mathews, 1990; MacArthur, 1996; Roberts & Salter, 1999). A number of hypotheses relating societal values to accounting sub-cultural values have been proposed. In particular, Perera (1989) developed a useful explanation of cultural factors specifically for the context of developing countries' accounting systems. He argues that a combination of accounting sub-cultural dimensions have considerable influence on accounting practices.

3.3. Schwartz's cultural dimensions of values

On the basis of data gathered during the 1988–1992 period from 86 samples drawn from 41 cultural groups in 38 nations, Schwartz (1994, p. 102) and Schwartz and Bardi (1997, p. 396) divided national cultures into seven value types:

Conservatism: Emphasis on the status quo, propriety, and restraint of actions or inclinations that might disrupt the solidary group or the traditional order.

Autonomy: Emphasis on the person viewed as an autonomous entity entitled to pursue his or her individual interests and desires. It can be split into two sub-dimensions:

- *Intellectual autonomy*: Emphasis on self-direction and flexibility of thoughts.
- *Affective autonomy*: Emphasis on stimulation and hedonism.

Hierarchy: Emphasis on the legitimacy of the hierarchical role and resource allocation.

Mastery: Emphasis on active mastery of the social environment through self-assertion. Promotion of active efforts to modify one's surroundings and get ahead of other people.

Egalitarian commitment: Emphasis on transcendence of selfish interests, voluntary commitment to promoting the welfare of other people.

Harmony: Emphasis on fitting harmoniously into the environment—protecting the environment, unity with nature, world of beauty.

Appendix D shows the scores for these seven dimensions for the countries surveyed (based on Schwartz, 1994, p. 112–115; Schwartz & Bardi, 1997, p. 397, 399). Thirty-two countries are common to Schwartz's sample and our sample of IAS indexes.

These seven culture-level value types are condensed by Schwartz into two broad dimensions: (1) autonomy versus conservatism and (2) egalitarian commitment and harmony versus hierarchy and mastery. Schwartz's (1994) cultural dimensions of values have recently been used in international accounting (Hope, 2003) or finance (Chui, Lloyd, & Kwok, 2002) research as a useful complement to Hofstede's model.

3.4. Hypotheses

3.4.1. Culture

The theory behind our hypotheses is that culture plays an important role in shaping the accounting standards and practices of a particular country (Perera, 1994). We expect that the level of harmonization with the IAS will vary between countries, especially between those with different cultural dimensions.

As said earlier, this study concentrates on differences between IAS and national GAAP (see previous section for a description of the two categories below):

Divergence: The national GAAP cover the specific accounting field also regulated by IAS, however the two sets of accounting standards propose different solutions;

Absence: the national GAAP do not cover the specific accounting field regulated by IAS.

Our first hypothesis is formulated on the basis of the two models of culture described above: Hofstede (1980, 1991, 2001) and Schwartz (1994).

H1. Culture matters in explaining divergence with IAS and the absence of local standards on topics covered by IAS.

3.4.2. Legal origin

This paper concentrates primarily on culture as an explanatory variable for two reasons: first, recent literature in economics and finance (Greif, 1994; Landes, 2000; Stulz & Williamson, 2003) demonstrates that culture is a determinant of economic institutions; second, culture has not yet been taken into consideration in explaining international accounting harmonization. But we also introduce the legal origin factor into our models. Several authors have examined the link between disclosure levels and culture and legal origin (Jaggi & Low, 2000; Hope, 2003), and legal origin emerged as a variable that could explain disclosure level. Moreover, La Porta et al. (1998, 2000) show that legal origin proxies for various institutional factors such as investor protection and ownership concentration.

If it is accepted that IAS represent a more uniform, less conservative, and less secretive set of standards than most national GAAP in the world, and that common-law countries are traditionally favorable to full disclosure (Ball et al., 2000), then common-law countries can be expected to show less divergence from IAS. They are also likely to have more highly developed regulation systems than code-law countries.

H2. Common-law countries are likely to have accounting standards that diverge less from IAS than those of code-law countries.

H3. Common-law countries are likely to have accounting standards that are more extensive than those of code-law countries with regard to IAS.

4. Measurement of the independent variables

We apply first Hofstede's cultural dimensions, then Schwartz's value types.

4.1. Research design no. 1: Hofstede's cultural dimensions

Hofstede (1980, 1991, 2001) proposed a definition and scoring system for five cultural dimensions as summarized in Section 3: *power distance index* (*pdi*), *masculinity* (*mas*), *individualism* (*ind*), *uncertainty avoidance* (*ua*), and *long-term orientation*. As mentioned above, this last dimension is disregarded in this study because data are only available for a limited number of countries. Hofstede's initial sample included 66 countries, 52 of which are in our sample of IAS difference/absence/conformity indexes (Appendix E lists the 52 countries included in our sample).

A brief examination of the correlation matrix (not tabulated) reveals a potential multicollinearity problem, since *power distance* and *individualism* are both negatively and significantly correlated (0.63 at the 0.01 level).

To avoid the effects of multicollinearity, which threatens to affect the interpretation of the regression results, we will run several variations of the same model, excluding some

Table 3

Pearson's correlation matrix of Schwartz's value types for the 32-country sample

	Conservatism	Affective autonomy	Intellectual autonomy	Hierarchy	Mastery	Egalitarian commitment	Harmony
Conservatism	1.000						
Affective autonomy	−0.780***	1.000					
Intellectual autonomy	−0.744***	0.703***	1.000				
Hierarchy	0.407	−0.246	−0.394	1.000			
Mastery	−0.152	0.113	−0.095	0.321	1.000		
Egalitarian commitment	−0.711	0.400	0.328	−0.579***	−0.005	1.000	
Harmony	−0.262	0.098	0.323	−0.536***	−0.299	0.372	1.000

***Correlation significant at the 0.01 level.

variables. Collinearity can also be diagnosed by evaluating the VIF (variance inflation factor) for each variable.²

4.2. Research design no. 2: Schwartz's value types

Schwartz (1994) proposed a definition and sourcing system for seven value types as summarized in Section 3: conservatism, intellectual autonomy, affective autonomy, hierarchy, mastery, egalitarian commitment, and harmony. 32 countries are common to Schwartz's and our sample of IAS indexes (Appendix F lists the 32 countries included in this sub-sample). We examine the correlation matrix between these seven variables (Table 3). Multicollinearity can be diagnosed because conservatism is negatively and significantly correlated with affective autonomy, intellectual autonomy, and egalitarian commitment, whereas hierarchy is negatively and significantly correlated with egalitarian commitment and harmony.

To avoid this multicollinearity problem, which seems to be more serious than in the case of Hofstede's variables, we conduct a factor analysis of the seven Schwartz value type variables using a principal component extraction method with a varimax rotation.

The eigen values associated with each factor are reported in Table 4. Consistent with Hair, Anderson, Tatham, & Black (1998), we select factors only if their eigen value is greater than one. A two-factor solution clearly appears, explaining more than 70% of the variance.

Using the rotated factor matrix, shown in Table 4, taking into account the sign and magnitude of factor loading, factor 1 and factor 2 can be interpreted as follows:

- A high score on factor 1 means that the inhabitants of the country accept *harmony* but not *hierarchy* and *mastery*. To simplify, we will call this the “no hierarchy” factor.

² The VIF measures the degree to which each explanatory variable is explained by the other explanatory variables. Traditionally, collinearity is not considered to be a problem when the VIF does not exceed 10 (Neter, Wasserman, & Kutner, 1983).

Table 4

Varimax principal components factor analysis (Schwartz's value types)

	Eigen values	Percentage of variance explained	Cumulative percentage explained
Conservatism	3.365	0.481	0.481
Affective autonomy	1.562	0.223	0.704
Intellectual autonomy	0.847	0.121	0.825
Hierarchy	0.560	0.080	0.905
Mastery	0.359	0.051	0.956
Egalitarian commitment	0.235	0.034	0.990
Harmony	0.072	0.010	1.000

	Factor 1	Factor 2
Conservatism	−0.121	−0.956
Affective autonomy	−0.056	0.883
Intellectual autonomy	0.231	0.787
Hierarchy	−0.770	−0.369
Mastery	−0.722	0.271
Egalitarian commitment	0.415	0.642
Harmony	0.776	0.186

– Factor 2 is mainly driven by *autonomy* (either *affective* or *intellectual*) as opposed to *conservatism*. To simplify, we will call this the “*autonomy*” factor.

Our results are similar to those of Schwartz (1994) and Schwartz and Bardi (1997). To measure culture, we will use the scores corresponding to the two factors which, by construction, are not correlated.

4.3. Legal origin

Legal origin is defined by the common-law/code-law distinction as used by La Porta, Lopez-de-Silanes, Shleiffer, and Vishny (1997). As certain countries (mainly former Eastern-bloc countries) are not included in these authors' sample, we use the classification devised by the University of Ottawa³ to extend our sample.

5. Statistical results

For each cultural model, we start with a brief presentation of univariate statistics. A multivariate analysis is then conducted and results are discussed.

5.1. Univariate results

Table 5 reports correlations between divergence/absence and our cultural (panels A and B) and institutional factor (panel C) proxies.

³ This list can be downloaded at the following address: <http://www.droitcivil.uottawa.ca/world-legal-systems-eng-tableau.html>.

Table 5

Univariate tests: Pearson's correlation between IAS indexes and (1) cultural dimensions and (2) legal origin

Variables	Divergence	Absence
<i>Panel A: Hofstede's cultural dimensions</i>		
Power distance index	–0.366***	0.130
(<i>p</i>)	(0.008)	(0.357)
Individualism	0.485***	–0.101
(<i>p</i>)	(0.000)	(0.476)
Masculinity	0.137	0.164
(<i>p</i>)	(0.331)	(0.245)
Uncertainty avoidance	0.161	0.338**
(<i>p</i>)	(0.255)	(0.014)
<i>Panel B: Schwartz's value types</i>		
Factor 1 (No hierarchy)	0.413**	0.315
(<i>p</i>)	(0.019)	(0.079)
Factor 2 (Autonomy)	0.507***	–0.015
(<i>p</i>)	(0.003)	(0.936)
<i>Panel C: Legal origin</i>		
Common law	–0.143	–0.396***
(<i>p</i>)	(0.294)	(0.003)

** Correlation is significant at the 0.05 level (2-tailed).

*** Correlation is significant at the 0.01 level (2-tailed).

Definition of variables: *Divergence* is the number of items (out of 111) for which national GAAP and IAS diverge (prescription of different solutions to the same problem). *Absence* is the number of items absent in national GAAP compared to IAS (items covered in IAS but not in national GAAP). *Power distance index*: The extent to which the less powerful members of society accept that power is unequally distributed. *Individualism*: In individualistic societies there are few ties beyond those of the nuclear family, whereas in collectivist societies people belong to strong, cohesive in-groups. *Masculinity*: In “masculine” societies men are assertive, tough, and concerned with material success, whereas women are more modest, tender, and interested in the quality of life. In “feminine” societies, both are equally concerned with quality of life. *Uncertainty avoidance*: The extent to which people feel threatened by uncertain or unknown situations. This is expressed in a need for formality, predictability and clear rules. *Factor 1* measures the level of acceptance of *harmony* but not of *hierarchy* and *mastery*. To simplify, we call *factor 1* the “no hierarchy” factor. *Factor 2* measures *autonomy* (either *affective* or *intellectual*) as opposed to *conservatism*. To simplify, we call *factor 2* the “autonomy” factor. *Common law* is a dummy variable coded 1 if the country has a common law tradition. All variables are country-specific measures.

Panel A reports the Pearson's correlation between the four cultural dimensions identified by Hofstede (1980, 1991, 2001) and our divergence/absence scores.

- The divergence index is significantly negatively correlated with the *power distance index* and positively with *individualism*. This gives support to our first hypothesis (H1).
- The absence index is significantly positively correlated with *uncertainty avoidance*, in accordance with the same hypothesis.

Overall, univariate results give support to our first hypothesis.

Panel B reports the Pearson's correlation between the two main cultural dimensions identified on the basis of Schwartz (1994) and our divergence/absence scores.

- The divergence index is significantly positively correlated with *no hierarchy* (factor 1) and *autonomy* (factor 2). This also gives support to our first hypothesis (H1).
- The absence index is not correlated with *either of the two factors*, which is not in accordance with H1.

Panel C exhibits no correlation between the level of divergence and legal origin. However, there is a negative correlation between the level of absence and legal origin, which seems to provide support for H3: code-law countries have a less extensive set of standards, compared to IAS, than their common law counterparts.

5.2. Regression results: Hofstede's cultural dimensions

Multivariate analysis results are presented in Table 6. Panel A presents the results for the divergence index, and panel B for the absence index. For each, we estimate alternative specifications for two basic models:

$$\begin{aligned} \text{Divergence} = & \alpha_0 + \alpha_1 \text{Power distance index} + \alpha_2 \text{Individualism} + \alpha_3 \text{Masculinity} \\ & + \alpha_4 \text{Uncertainty avoidance} + \alpha_5 \text{Common law} + \varepsilon \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Absence} = & \beta_0 + \beta_1 \text{Power distance index} + \beta_2 \text{Individualism} + \beta_3 \text{Masculinity} \\ & + \beta_4 \text{Uncertainty avoidance} + \beta_5 \text{Common law} + \varepsilon \end{aligned} \quad (2)$$

We tabulate two specifications for each equation:

- Model (1) and model (3): with four cultural variables only (*power distance index*, *individualism*, *masculinity*, and *uncertainty avoidance*);
- Model (2) and model (4): full models including cultural variables and legal origin (*common law*).

We computed the VIFs, which are all lower than 2.08. Multicollinearity does not thus appear to be a real problem.

In model (1), divergence with IAS is apparently explained by differences in culture, particularly as adjusted R^2 is almost 27%. *Divergence* is significantly related to *individualism* and *uncertainty avoidance*.

Concerning *uncertainty avoidance*, our results demonstrate that countries with a higher level of *uncertainty avoidance* will not prefer uniformity and will thus be less inclined to conform with IAS. The IAS are known to require a high level of disclosure, to favor a “transparent” (less secretive) approach to financial reporting, and to be less conservative (Ball et al., 2000). Our result is consistent with Salter and Niswander (1995) who carried out one of the most comprehensive studies on the relationship between culture and international accounting differences. They find a negative relationship between uniformity and *uncertainty avoidance*, in contrast to Gray (1988)’s prediction. They even mention “other principles for which a market in information exists and for which Gray’s proposition may not hold” (p. 389). Finally, Dougnik and Salter (1995) associate a set of

Table 6

Regression results: Hofstede's cultural dimensions and legal origin

	Panel A: divergence		Panel B: absence	
	(1)	(2)	(3)	(4)
Power distance index	−0.064	−0.063	0.029	−0.021
Sig.	0.331	0.350	0.810	0.857
Individualism	0.164	0.162	−0.012	−0.034
Sig.	0.011**	0.013**	0.918	0.757
Masculinity	0.054	0.055	0.100	0.133
Sig.	0.342	0.339	0.341	0.186
Uncertainty avoidance	0.102	0.085	0.202	0.126
Sig.	0.037**	0.129	0.026**	0.195
Common law (dummy variable)		−1.666		−8.167
Sig.		0.572		0.114
Constant	7.185	8.935	4.403	12.814
Sig.	0.298	0.237	0.728	0.326
Observations	52	50	52	50
R^2	0.325	0.329	0.138	0.198
Adj R^2	0.267	0.253	0.064	0.107
F	5.656	4.320	1.879	2.170
Sig. (F)	0.001	0.003	0.130	0.075

** Coefficient significant at the 0.05 level (2-tailed).

Definition of variables: *Divergence* is the number of items (out of 111) for which national GAAP and IAS diverge (prescription of different solutions to the same problem). *Absence* is the number of items absent in national GAAP compared to IAS (items covered in IAS but not in national GAAP). *Divergence* and *Absence* are country-specific measures. *Power distance*: The extent to which the less powerful members of society accept that power is unequally distributed. *Individualism*: In individualistic societies there are few ties beyond those of the nuclear family, whereas in collectivist societies people belong to strong, cohesive in-groups. *Masculinity*: In "masculine" societies men are assertive, tough, and concerned with material success, whereas women are more modest, tender, and interested in the quality of life. In "feminine" societies, both are equally concerned with quality of life. *Uncertainty avoidance*: The extent to which people feel threatened by uncertain or unknown situations. This is expressed in a need for formality, predictability and clear rules. *Common law* is a dummy variable coded 1 if the country has a common law tradition.

environmental factors and cultural dimensions with international differences in accounting practices. They propose a general model of international accounting development and empirically test its explanatory power. They find that a higher level of disclosure is consistent with a lower level of *uncertainty avoidance* and that low *uncertainty avoidance* groups tend to be less conservative. Countries experiencing a higher level of *uncertainty avoidance* would thus be expected to try to diverge from IAS in order to avoid the high level of disclosure required.

In model (2), we added legal origin (*common law*) to cultural variables. This variable turns out to be unrelated to the level of divergence, which goes against H2. This is an interesting result, showing that legal origin, which has appeared to be a valuable explanatory factor in several studies (Hope, 2003), does not, in fact, play a significant role, probably because the common-law/code-law dichotomy covers a wide diversity of national systems. We also note that the coefficient on uncertainty avoidance becomes non-significant, which suggests that strong links exists between institutional and cultural factors.

As robustness checks, we also ran the regressions with other specifications (excluding *masculinity* and legal origin, excluding *power distance index*, *masculinity* and legal origin and excluding *power distance index*). In one of the specifications, we excluded *masculinity*, following the example of Hope (2003, p. 222, 238), who mentions that some authors consider the link between this dimension and disclosures (the topic studied by Hope) to be more questionable or less important (Gray, 1988; Haskins, Ferris, & Selling, 2000). Our results (not tabulated) are similar.

The *absence* index (absence of national accounting rules on an issue covered by IAS) is not explained by cultural variables, since the *F* statistic is not significant at 5% in model (3). This result can be explained as follows. An analysis of the most frequent items covered by an IAS but not by national rules shows that they relate to IAS 14 (segment information), 19 (employee benefits), 22 (business combinations), 33 (earnings per share computation), 35 (discontinuing operations), 32 and 39 (financial instruments), and 40 (specifically, the fair value of property investments). These standards depend more on the level of economic development and the size of the capital market than national culture. To proxy for these two variables, we also added legal origin to the research design for the measurement of absence (see Table 5, panel B, model (4). La Porta et al. (1997) show that in common law countries, capital market development is higher than in code-law countries. Nevertheless, legal origin does no better than cultural values in explaining the absence index, since the *F* statistic is still not significant at 5%.

Overall, our results suggest that a “divergence” status with regard to IAS can be explained by variations in national culture. Such is not the case for the *absence* index.

5.3. Regression results: Schwartz's value types

Multivariate analysis results are presented in Table 7. Panel A presents the results for the *divergence* index, and Panel B for the *absence* index. For each, we estimate alternative specifications for two basic models:

$$\begin{aligned} \text{Divergence} = & \alpha_0 + \alpha_1 \text{Factor 1 (No hierarchy)} + \alpha_2 \text{Factor 2 (Autonomy)} \\ & + \alpha_3 \text{Common law} + \varepsilon \end{aligned} \quad (3)$$

$$\begin{aligned} \text{Absence} = & \alpha_0 + \alpha_1 \text{Factor 1 (No hierarchy)} + \alpha_2 \text{Factor 2 (Autonomy)} \\ & + \alpha_3 \text{Common law} + \varepsilon \end{aligned} \quad (4)$$

As we did with Hofstede's cultural values, we tabulate two specifications for each equation:

- Model (1) and model (3): with cultural factors only (*factor 1 — no hierarchy* and *factor 2—autonomy*);
- Model (2) and model (4): full model including cultural factors and legal origin (*common-law*).

The divergence from IAS is apparently explained by differences in culture, particularly as adjusted R^2 is almost 39%. Our first hypothesis is backed by the multivariate analysis concerning *divergence* (model (1)), since both variables, which correspond to factors 1 and 2 defined in Section 4 above, are significant at conventional levels. Schwartz's first sub-dimension corresponds to our factor 1, i.e. autonomy versus conservatism. This shows that countries with a high autonomy score are more inclined to diverge from IAS.

The second sub-dimension corresponds to the values of egalitarian commitment and harmony versus hierarchy and mastery. Hierarchy can be linked to international accounting harmonization: the greater a country's acceptance of hierarchy, the more likely it is to accept external influence from a supra-national source, and consequently the IAS. The same applies to mastery: taking action to control the environment appears to be quite compatible with acceptance of an external influence. The same reasoning works conversely. Our results show that a country with a lower hierarchy/mastery score is likely to have accounting standards that diverge from IAS.

There is no association between divergence and legal origin (panel A, model (2)), if this variable is added to factors 1 and 2, previously identified as summarizing Schwartz's value types.

The *absence* index (absence of national accounting rules concerning an issue covered by IAS) is not explained by cultural variables, since the F statistic is not significant at 5% whatever the specifications (models (3) and (4)).

Table 7
Regression results: Schwartz's cultural dimensions and legal origin

	Panel A: divergence		Panel B: absence	
	(1)	(2)	(3)	(4)
Factor 1 (No hierarchy)	3.092	2.087	3.802	1.765
Sig.	0.006***	0.089*	0.084*	0.468
Factor 2 (Autonomy)	3.791	3.443	-0.179	-0.884
Sig.	0.001***	0.003***	0.933	0.678
Common law		-4.563		-9.258
Sig.		0.106		0.105
Constant	22.594	23.734	26.063	28.377
Sig.	0.000***	0.000***	0.000***	0.000***
Observations	32	32	32	32
R^2	0.427	0.479	0.099	0.181
Adj R^2	0.388	0.423	0.037	0.094
F	10.821	8.586	1.600	2.066
Sig. (F)	0.000	0.000	0.219	0.181

* Coefficient significant at the 0.10 level (2-tailed).

*** Coefficient significant at the 0.01 level (2-tailed).

Divergence is the number of items (out of 111) for which national GAAP and IAS diverge (prescription of different solutions to the same problem). *Absence* is the number of items absent in national GAAP compared to IAS (items covered in IAS but not in national GAAP). *Factor 1* measures the level of acceptance of *harmony* but not of *hierarchy* and *mastery*. To simplify, we call *factor 1* the "no hierarchy" factor. *Factor 2* measures *autonomy* (either *affective* or *intellectual*) as opposed to *conservatism*. To simplify, we call *factor 2* the "autonomy" factor. *Common law* is a dummy variable coded 1 if the country has a common-law tradition.

Overall, our results suggest that a “diverging” status with regard to IAS can be explained by variations in national culture.

6. Limitations

One of the contributions of this paper is the creation of new measures of international accounting differences. However, it should be noted that our measures are based on Nobe’s (2001) study, which relies upon subjective responses. Moreover, in computing our divergence/absence indexes, we considered that each of the 111 items studied was of equal weight: we then counted the number of divergence/absence responses for each country in our sample. *Divergence* and *absence* were thus treated as continuous variables. For instance, a country with 50% *divergence* is deemed to be twice as divergent as a country that is 25% divergent. This “equal-weight” assumption may be debatable, but the same could be said of the contrary solution (attributing a specific weight to each item over a total of 111). The definition of a specific weight would imply that IAS are not equally important, and the concept of the importance of one IAS is not easily evaluated.

Another possible limitation lies in the fact that our vision of national culture is partly derived from Hofstede (1980). Hofstede’s model has been strongly criticized (Baskerville, 2003) but is still widely used because of its extensive international coverage, and has generated robust results. When using Schwartz’s value types, our results still hold, which strengthens evidence for the influence of culture on international accounting harmonization.

7. Conclusion

This study is designed to examine whether differences between national accounting standards and IAS are explained by cultural dimensions and legal origin. We measure differences between national GAAP and IAS using two innovative measures: *divergence* and *absence*. *Divergence* measures the degree to which national GAAP and IAS cover a specific accounting topic but prescribe different methods. *Absence* measures the degree to which national GAAP do not cover an accounting issue regulated by IAS. We use two different sets of measures to proxy culture: the first from Hofstede (1980, 1991, 2001) and the second from Schwartz (1994). We find that cultural values are associated with our *divergence* index and matter even more than legal origin in explaining divergences from IAS. With regard to the *absence* index, we find no significant relationship with either cultural values or legal origin. These results contribute to the existing literature in two ways: (1) the relationship between culture and international accounting harmonization has not been studied previously, and (2) although legal origin is usually considered as an explanatory variable for accounting information (Ball et al., 2000), this does not seem to be the case at the level of accounting regulation in the context of international accounting harmonization.

This paper contributes to the ongoing debate on accounting harmonization. More specifically, our findings suggest that the technical and/or political dimensions of the

debate, although essential, are not the only issues involved. Opposition to IAS is not driven exclusively by contractual motives or a claimed technical superiority but also by diversity in cultural factors. Another contribution of this paper is the development of a two-dimensional score to benchmark the differences between national GAAP and IAS.

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Appendix A. Australia (Source: Nobes, 2001, p. 14)

Australian requirements are based mainly on the Corporations Act 2001 and the standards of the Australian Accounting Standards Board and Abstracts of the Urgent Issues Group.

Australian accounting may differ from that required by IAS because of the absence of specific Australian rules on recognition and measurement in the following areas:

Intangible assets	IAS 38
The derecognition of financial assets	IAS 39.35
Provisions, except for certain specific cases such as redundancy and cyclical maintenance	IAS 37
Defined benefit employee obligations	IAS 19
The treatment of dividends proposed after the balance sheet date, particularly as practice is generally to accrue for them	IAS 10
Detailed requirements for calculating impairment; it is not necessary to discount the cash flows when calculating recoverable amount for impairment losses.	IAS 36.5
There are no specific rules requiring disclosures of:	
The fair values of investment properties	IAS 40.69
Discontinuing operations	IAS 35
Segment liabilities.	IAS 14.56
There are inconsistencies between Australian and IAS rules that could lead to differences for many enterprises in certain areas. Under Australian rules:	
Trading, available-for-sale and derivative financial assets are not recognized at fair value	IAS 39.69
Trading and derivative liabilities are not recognized at fair value	IAS 39.93
Gains and losses on the change in value of trading financial instruments are not required to be taken to income	IAS 39.103
Hedge accounting is permitted more widely	IAS 39.142
Deferred tax is accounted for on the basis of timing differences rather than temporary differences	IAS 12.15

On disposal of a foreign entity, the cumulative amount of deferred exchange differences in equity is not recognized in income	IAS 21.37
Investment properties can be held at cost without depreciation	IAS 40.50
The changes in value of investment properties held at a current value are taken as reserves	IAS 40.28
Revaluations of intangible assets are permitted without an active market	IAS 38.64
Poolings/unitings of interests are prohibited	IAS 22.77
In the context of a business combination accounted for as an acquisition, provisions may be created more extensively than under the IAS	IAS 22.31
A primary/secondary basis is not used for segment reporting	IAS 14.26
Earnings per share is calculated before extraordinary items, and there are other differences.	IAS 33
In certain enterprises, these other issues could lead to differences from IAS:	
There are no specific rules concerning the translation of the financial statements of hyperinflationary subsidiaries	IAS 21.36
An event after the balance sheet date indicating that the enterprise is not a going concern is not treated as an adjusting event	IAS 10.13
Research costs could be capitalized if they meet a recoverability test	IAS 38.42
Negative goodwill is eliminated by proportionately writing down the carrying value of non-monetary assets	IAS 22.59
Government grants are recognized in full when an enterprise has a right to receive them and no obligation to repay	IAS 20.12/24
There is no specific prohibition of discounting of deferred tax balances	IAS 12.53

Appendix B. Survey questionnaire (beginning) (Source: Nobes, 2001, p. 149)

IAS reference		National GAAP for 31 December 2001	
Para	Extract from IAS text		Question
27.11	A parent which issues consolidated financial statements should consolidate all subsidiaries, foreign and domestic, other than those referred to in paragraph 13.	1	When there are subsidiaries must consolidated accounts be prepared?
27.6	A subsidiary is an enterprise that is controlled by another enterprise (known as the parent). Control (for the purpose of this Standard) is the power to govern the financial and operating policies of an enterprise so as to obtain benefits from its activities.	2	Is a subsidiary defined on the basis of de facto control (which can exist without majority ownership)?

Appendix C. Hofstede's indexes for 52 countries (2001, p. 500, 502)

	PDI		IND		MAS		UA	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Argentina	35/36	49	22/23	46	20/21	56	10/15	86
Australia	41	36	2	90	16	61	37	51
Austria	53	11	18	55	2	79	24/25	70
Belgium	20	65	8	75	22	54	5/6	94
Brazil	14	69	26/27	38	27	49	21/22	76
Bulgaria		70		30		40		85

(continued on next page)

Appendix C (continued)

	PDI		IND		MAS		UA	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Canada	39	39	4/5	80	24	52	41/42	48
Chile	24/25	63	38	23	46	28	10/15	86
China		80		20		66		30
Czech Republic		57		58		57		74
Denmark	51	18	9	74	50	16	51	23
Estonia		40		60		30		60
Finland	46	33	17	63	47	26	31/32	59
France	15/16	68	10/11	71	35/36	43	10/15	86
Germany FR	42/44	35	15	67	9/10	66	29	65
Great Britain	42/44	35	3	89	9/10	66	47/48	35
Greece	27/28	60	30	35	18/19	57	1	112
Hong Kong	15/16	68	37	25	18/19	57	49/50	29
Hungary		46		80		88		82
India	10/11	77	21	48	20/21	56	45	40
Indonesia	8/9	78	47/48	14	30/31	46	41/42	48
Iran	29/30	58	24	41	35/36	43	31/32	59
Ireland (Rep of)	49	28	12	70	7/8	68	47/48	35
Israel	52	13	19	54	29	47	19	81
Italy	34	50	7	76	4/5	70	23	75
Japan	33	54	22/23	46	1	95	7	92
Luxembourg		40		60		50		70
Malaysia	1	104	36	26	25/26	50	46	36
Mexico	5/6	81	32	30	6	69	18	82
Morocco		70		46		53		68
Netherlands	40	38	4/5	80	51	14	35	53
New Zealand	50	22	6	79	17	58	39/40	49
Norway	47/48	31	13	69	52	8	38	50
Pakistan	32	55	47/48	14	25/26	50	24/25	70
Peru	21/23	64	45	16	37/38	42	9	87
Philippines	4	94	31	32	11/12	64	44	44
Poland		68		60		64		93
Portugal	24/25	63	33/35	27	45	31	2	104
Romania		90		30		42		90
Russia		93		39		36		95
Singapore	13	74	39/41	20	28	48	53	8
Slovakia		104		52		110		51
South Africa	35/36	49	16	65	13/14	63	39/40	49
South Korea	27/28	60	43	18	41	39	16/17	85
Spain	31	57	20	51	37/38	42	10/15	86
Sweden	47/48	31	10/11	71	53	5	49/50	29
Switzerland	45	34	14	68	4/5	70	33	58
Taiwan	29/30	58	44	17	32/33	45	26	69
Thailand	21/23	64	39/41	20	44	34	30	64
Turkey	18/19	66	28	37	32/33	45	16/17	85
USA	38	40	1	91	15	62	43	46
Venezuela	5/6	81	50	12	3	73	21/22	76

PDI = Power distance index; IND = Individualism index; MAS = Masculinity index; UA = Uncertainty avoidance; LTO = Long-term orientation index. Countries with no indication of rank have been added more recently in Hofstede (2001).

Appendix D. Schwartz's indexes (1994, p. 112–115, Schwartz and Bardi, 1997, p. 397, 399)

Country	Conservatism	Affective autonomy	Intellectual autonomy	Hierarchy	Mastery	Egalitarian commitment	Harmony
Australia	4.06	3.50	4.12	2.36	4.09	4.98	4.05
Brazil	3.97	3.30	4.13	2.64	4.16	4.92	4.02
Bulgaria	4.43	3.13	3.78	3.07	4.04	4.83	4.32
China	3.97	3.32	4.27	3.70	4.73	4.49	3.71
Czech Republic	3.95	3.12	4.30	2.07	3.76	4.89	4.39
Denmark	3.64	4.01	4.58	1.86	3.97	5.52	4.16
Estonia	4.26	3.08	3.63	2.00	3.73	4.96	4.65
Finland	3.84	3.51	4.62	2.03	3.63	5.26	4.54
France	3.35	4.41	5.15	2.16	3.89	5.45	4.31
Germany	3.42	4.03	4.75	2.27	4.07	5.37	4.42
Greece	3.68	3.96	4.09	2.01	4.53	5.35	4.39
Hong Kong	4.04	3.11	4.08	2.83	4.18	4.85	3.34
Hungary	3.97	3.34	4.44	2.42	3.96	4.87	4.51
Israel	4.08	3.62	4.31	2.69	4.06	4.78	3.01
Italy	3.82	2.95	4.60	1.69	4.08	5.57	4.80
Japan	3.87	3.54	4.68	2.86	4.27	4.69	4.07
Malaysia	4.46	3.16	4.07	2.43	4.34	4.66	3.50
Mexico	4.03	3.23	4.20	2.35	4.34	4.99	4.67
Netherlands	3.68	3.51	4.44	2.26	3.98	5.39	3.98
New Zealand	3.73	3.98	4.36	2.38	4.23	5.15	3.99
Poland	4.31	3.13	4.09	2.53	4.00	4.82	4.10
Portugal	3.76	3.54	4.12	2.08	4.25	5.62	4.29
Russia	4.17	3.04	4.27	2.47	3.74	4.68	3.74
Singapore	4.38	3.04	3.68	2.75	3.93	4.79	3.72
Slovakia	4.28	2.76	4.03	2.11	4.09	4.98	4.40
Slovenia	4.27	3.76	5.03	1.76	3.76	4.36	4.72
Spain	3.42	3.97	4.90	2.03	4.11	5.55	4.53
Switzerland	3.25	4.24	5.33	2.20	4.18	5.19	4.50
Taiwan	4.31	3.21	3.93	2.85	4.11	4.68	4.17
Thailand	4.22	3.62	4.08	3.32	3.99	4.34	3.93
Turkey	4.27	3.25	4.12	3.30	3.90	5.12	4.26
USA	3.90	3.65	4.20	2.39	4.34	5.03	3.70

Appendix E. 52 countries included in the sample

Argentina	France	Luxembourg	Russian Federation
Australia	Germany	Malaysia	Singapore
Austria	Greece	Mexico	Slovakia
Belgium	Hong Kong	Morocco	South Africa
Brazil	Hungary	Netherlands	Spain
Bulgaria	India	New Zealand	Sweden
Canada	Indonesia	Norway	Switzerland
Chile	Iran	Pakistan	Taiwan

China (People's Republic)	Ireland	Peru	Thailand
Czech Republic	Israel	Philippines	Turkey
Denmark	Italy	Poland	United Kingdom
Estonia	Japan	Portugal	United States
Finland	Korea (South)	Romania	Venezuela

Appendix F. 32 countries common to the Schwartz/IAS sample

Australia	France	Mexico	Slovenia
Brazil	Greece	Malaysia	Slovakia
Bulgaria	Hong Kong	Netherlands	Spain
China (People's Republic)	Germany	New Zealand	Switzerland
Czech Republic	Hungary	Poland	Taiwan
Denmark	Israel	Portugal	Thailand
Estonia	Italy	Russia	Turkey
Finland	Japan	Singapore	United States

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Discussion

Discussion of “Why do national GAAP differ from IAS? The role of culture”

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1. Introduction

The purpose of the study by Ding, Jeanjean, and Stolowy (DJS) (2005) is to investigate whether culture explains differences between national GAAP and International Accounting Standards (IAS).

First, the authors define differences between national GAAP and International Accounting Standards (IAS). Using Nobes' (2001) data and redefining his results, they construct two measures of accounting differences (divergence and absence) between national GAAP and IAS. Divergence measures the level of divergence of national GAAP, benchmarked on IAS and absence, assesses the scope of national accounting rules compared to IAS.

DJS also present Hofstede's (1980, 1991, 2001) cultural dimensions model (for 52 countries) and Gray's (1988) work that introduced Hofstede's cultural dimensions into accounting. Subsequently, DJS present cultural dimensions of values, which have been introduced recently by Schwartz (1994) (for 32 countries). Finally, DJS present hypotheses relating accounting differences to both culture and legal origin.

2. Hypotheses

DJS develop three hypotheses, one about the role of culture and two about legal origin. These hypotheses state that:

H1. Culture matters in explaining divergence with IAS and the absence of local standards on topics covered by IAS.

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H2. Common-law countries are likely to have accounting standards that diverge less from IAS than those of code law countries.

H3. Common-law countries are likely to have accounting standards that are more extensive.

3. Methodology

I. Based on Hofstede's (1980, 1991, 2001), cultural dimensions DJS propose the following critical variables:

Divergence: the number of items for which national GAAP and IAS diverge (prescription of different solutions to the same problem).

Absence: the number of items absent in national GAAP compared to IAS (items covered in IAS but not in national GAAP).

Power distance index: the extent to which the less powerful members of a society accept that power is unequally distributed.

Individualism: an index for individualistic societies, in which there are few ties beyond those in a nuclear family, whereas in collectivistic societies people belong to strong and cohesive in-groups.

Masculinity: an index for masculine societies, in which men are assertive, tough, and concerned with material success, whereas women are modest, tender, and interested in the quality of life. In "feminine" societies, both men and women are equally concerned with the quality of life.

Uncertainty avoidance: an index that denotes the extent to which people feel threatened by uncertain or unknown situations. This is expressed by the need for formality, predictability, and clear rules.

Common law: is a dummy variable coded 1 if the country has a common law tradition.

DJS use regression analysis to assess whether culture and legal origin play an important role in shaping accounting standards and examine two specifications for each model:

- A) One model with four cultural variables (Power distance index, Individualism, Masculinity, and Uncertainty avoidance) as explanatory variables.
- B) Another model with four cultural variables and legal origin (Common law) as explanatory variables.

The two models take the following form:

$$\text{Divergence} = \alpha_0 + \alpha_1 \text{Power distance index} + \alpha_2 \text{Individualism} + \alpha_3 \text{Masculinity} \\ + \alpha_4 \text{Uncertainty avoidance} + \beta_5 \text{Common law} + \varepsilon$$

$$\text{Absence} = \alpha_0 + \alpha_1 \text{Power distance index} + \alpha_2 \text{Individualism} + \alpha_3 \text{Masculinity} \\ + \beta_4 \text{Uncertainty avoidance} + \beta_5 \text{Common law} + \varepsilon.$$

II. Based on Schwartz's (1994) value types, the following variables are defined:

Divergence: the number of items on which national GAAP and IAS diverge (prescription of different solutions to the same problem).

Absence: the number of items absent in national GAAP compared to IAS (items covered in IAS but not in national GAAP).

Factor 1: measures the level of acceptance of harmony but not of hierarchy and mastery. DJS call Factor 1 the "no hierarchy" factor.

Factor 2: measures autonomy (either affective or intellectual) as opposed to conservatism. DJS call Factor 2 the "autonomy" factor.

Common law: is a dummy variable coded 1 if the country has a common law tradition. Legal origin is defined by the common law/code law distinction as used by La Porta, Lopez-de-Silanes, Shleiffer, and Vishny (1997).

They conduct a factor analysis of the seven Schwartz (1994) value type variables (Conservatism, Intellectual autonomy, Affective autonomy, Hierarchy, Mastery, Egalitarian commitment and Harmony) using a principal components extraction method with a Varimax rotation to avoid the multicollinearity problem. They select two factors which explain more than 70% of the variance. To measure culture, they use the scores corresponding to the two factors. They examine the following two models:

$$\begin{aligned} \text{Divergence} = & \alpha_0 + \alpha_1 \text{Factor1(No Hierarchy)} + \alpha_2 \text{Factor2(Autonomy)} \\ & + \alpha_3 \text{Common law} + \varepsilon \end{aligned}$$

$$\begin{aligned} \text{Absence} = & \alpha_0 + \alpha_1 \text{Factor1(No hierarchy)} + \alpha_2 \text{Factor2(Autonomy)} \\ & + \alpha_3 \text{Common law} + \varepsilon. \end{aligned}$$

4. Results

Their statistical results—based on factor analysis and regression analysis—show that the level of divergence between National Accounting Standards and International Accounting Standards is related to cultural dimensions.

When they use Hofstede's cultural dimensions, "Individualism" and "Uncertainty avoidance" are found to explain divergence from IAS in multivariate models. When DJS use Schwartz's dimensions, both factors (no hierarchy and autonomy) were statistically significant in explaining the divergence from IAS.

However, the cultural dimensions of a nation do not explain the level of absence, as the model was not statistically significant. An analysis by DJS of the most frequent items covered by IAS but not by national rules shows that national standards depend more on the level of economic development and the size of the capital market than on national culture. Legal origin has no explanatory power in the multivariate regression models no matter which cultural dimensions model were used.

5. General comments

Several studies have examined differences in international financial reporting based on two broad explanations. The first group of studies claims that differences result from culture (Doupnik & Salter, 1995; Gray, 1988; Jaggi, 1975; Perera, 1989; Salter & Niswander, 1995; Zarzeski, 1996), while the second, that differences result from differences in corporate governance systems (Nobes, 1983; Nobes & Parker, 1998).

Most studies of the first group have used Hofstede's cultural dimensions model to explain the differences in accounting practices (Archambault & Archambault, 2003; Arnold, Bernardib, & Neidermeyer, 2001; Gray, 1988; Hussein, 1996; Perera, 1989; Williams, 2004). Hofstede is the most often cited author in cross-cultural research (Dahl, 2004; Sondergaard, 1994) and has become the most cited author next to John Dunning and Michael Porter (Sivakuma & Nakata, 2001). Today, Hofstede's cultural indices have become a permanent feature in the textbooks for cross-culture education (Tang, 2005). A search of the Social Science Citation Index reveals that, from 1987 to 2004, Hofstede's concepts of culture's consequences (1980, 2001) were cited nearly as frequently (2858 citations) as Karl Marx's work *Capital* (2873 citations) (Bearden, Money, & Nevins, in press).

Hofstede's indices of culture have been received controversially in many disciplines. Although many critiques of Hofstede's work have appeared in the literature, they have not diminished the attractiveness of his model which is still used by researchers in managerial studies. Criticisms of Hofstede's model include a variety of methodological problems such as the exclusive use of IBM employees for his sample, the lack of cultural dimensions dynamics, the coincidence of culture with nation, the limited replication of his method in others samples, difficulties in quantifying culture, etc. An extensive list of problems related to accounting research is presented by Baskerville (2003) and Baskerville-Morley (2005), Bhimani (1999), Ahrens (1996), and Gernon and Wallace (1995).

One critique focuses on the fact that cultural values are based on matched samples of IBM employees. The data were collected using a self-completed questionnaire between 1967 and 1973 in 66 countries. The four culture indices (Power distance, Individualism, Uncertainty avoidance, and Masculinity) are calculated based on the average opinion as calculated from the answers in the questionnaire. One weakness of this methodology is that the sample is not representative because the data are derived from a single company and therefore do not provide information on the cultural values of the entire nation. Respondents came from 15 countries and numbered fewer than 200. A second criticism is that 30 years later, the IBM data are obsolete (McSweeney, 2002). Furthermore, the four cultural dimensions used are not enough to describe culture. Hofstede's four dimensions also may not fully describe all the issues societies must confront in order to regulate human activity (Bergeron & Schneider, 2005; Hofstede, 1980; Schwartz, 1994).

The main theoretical argument against the adoption of Hofstede's cultural dimensions model for the analysis of policy issues is its lack of normative perspective. If we accept both the theoretical and statistical results of the paper, then what is the suggested policy? No adoption, partial adoption, or complete adoption of International Accounting Standards? Does one have to wait until there is a decrease in Uncertainty Avoidance,

and if so, how can this be attained if the values of cultural dimensions are stable over time (as both the authors and Hofstede assert)? If the values of cultural dimensions are stable or change slowly, this implies that differences in culture are a significant obstacle to international harmonization.

Unfortunately, the strongest opponent against the adoption of Hofstede's cultural dimensions model for policy issues is Hofstede himself. As Hofstede wrote (2002, p. 1359) "... I never claimed that culture is the only thing we should pay attention to. In many practical cases it is redundant, and economic, political or institutional factors provide better explanations." Besides that, Hofstede has already (p. 1356–1357) warned the applied researcher for potential misuse of his model "In fact, this extensive use [of his model] has its disadvantages. Some people have tried to imitate my approach cheaply for commercial purposes. Some carry the concepts further than I consider wise. At times my supporters worry me more than my critics."

Besides the inefficiencies of Hofstede's model in analyzing policy issues (confirmed by Hofstede himself), "there may be other dimensions related to equally fundamental problems of mankind which were not found... because the relevant questions simply were not asked" (Hofstede 1980, p. 313–314). DJS, in their study, do not consider any economic factors as explanatory variables of the accounting differences across countries, although they mention three pure economic factors (rapid development of international capital markets, increasingly frequent cross-listing of multinationals, and the internationalized activities of institutional investors) as the driving forces behind international accounting harmonization. DJS use Hofstede's model to explain why the national GAAP differs from IAS, but why should masculinity explain these differences. Other authors consider the link between masculinity and disclosures to be very questionable (Gray, 1988; Hope, 2003).

Baskerville (2003) has also mentioned this problem in many studies that have used Hofstede's model, suggesting that research in international accounting "...requires systematic modeling of characteristics of nations based on well-established economic indices, as well as indices to take account of the nexus of historical and political tensions in each nation." From this perspective, it is questionable to consider the cultural factors listed in the paper separately from economic and social ones. A strong preference for uncertainty avoidance, to take just one example, can be linked to the absence of a well-functioning legal environment that provides swift and unbiased resolution to conflicts. Hence, agents compensate by following practices that are more predictable and conservative since they want to avoid the cost and uncertainty of litigation.

DJS blame socio-economic factors for the failure of the model when there is an absence of standards and at the same time omit them altogether when there is a divergence of standards. In fact, their absence results in a potential omitted-variable bias for the estimates of the culture variables coefficients. The results would be more robust if the cultural variables retained their significance and expected sign when socio-economic variables were included in the regression. As the situation stands now, cultural variables might be just a proxy for the socio-economic ones.

The measures of divergence and absence in DJS appear to be flawed since they put equal weight on all items of the International Accounting Standards. The considerable

differences in compliance for various items suggest that firms and regulatory agencies treat individual items very differently and this might be an indication of their varying importance.

A different approach to define cultural values has been taken by Schwartz (1994). His database is based on the response of schoolteachers and college students in 38 nations in the late 1980s and early 1990s. Schwartz used smallest space analysis, a statistical procedure that shows which items cluster together, and identified seven cultural values. Schwartz (1994) also found a high degree of association between the cultural values derived from his data and Hofstede's dimensions. However, his items are broader than those of Hofstede. Examining the commonalities between Hofstede's and Schwartz's cultural values, one realizes that certain facets appear to be missing, such as the time perspective of a culture or the temporal stability of the culture.

Recent research has focused more on the effects of other factors to explain the difference in accounting practices, e.g., the legal system (Hope, 2003; Jaggi & Low, 2000; Stulz & Williamson, 2003; Williams, 2004), the level of economic development (Adhikari & Tondkar, 1992; Ahmed, 1995; Cooke & Wallace, 1990; Douppnik & Salter, 1995; Williams, 2004), and the size of the equity market (Adhikari & Tondkar, 1992; Ahmed, 1995; Douppnik & Salter, 1995; Williams, 2004).

DJS also investigate the role of legal origin in explaining the differences between national GAAP and IAS. The inclusion of legal origin as an explanatory variable weakens the empirical findings because only one cultural dimension remained significant (individualism). It is very important that DJS conduct robustness tests as their results are highly susceptible to omitted-variable bias. In addition, the findings of the regression in table 6 panel b indicate that there is a multicollinearity problem. These findings show that when an additional variable (legal origin) is included in the model, there is a significant *F* statistic but no significant *t*-statistics.

Fechner and Kilgore (1994) report that there are significant correlations between uncertainty avoidance and the other three independent cultural variables (Power distance index, Individualism, and Masculinity). Saundagaran and Meek (1997) state that "one explanation for the finding that uncertainty avoidance dominates the other three cultural dimensions is that uncertainty avoidance is a summary index for the other three cultural dimensions." Others have attempted to add institutional variables (legal origin), however, as Saundagaran and Meek (1997) mention, "these environmental and cultural factors are clearly correlated."

The national accounting standards are the result of a complex interaction of cultural, historical, economic, and institutional factors. Factors that can influence accounting development are (1) the legal system, (2) the nature of the relationship between business enterprises and providers of capital, (3) the tax laws, (4) inflation levels, (5) political and economic ties, (6) the level of economic development, and (7) education levels Saundagaran & Meek (1990, 1997).

Finally, one cannot easily explain why DJS clearly ignore economic factors, differences in the development of national capital markets, and differences in national financial systems, since it is evident that their cultural dimensions explain nothing in the case of absence, and why they do not include these variables in the case of divergence.

6. Overall conclusion

Despite the limitations raised above, this study is an interesting attempt to understand differences between IAS and national GAAP. The authors could have expanded their study by investigating the influence of economic factors in understanding difference in accounting policies.

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Reply

Reply to discussion of “Why do national GAAP differ from IAS? The role of culture”

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The discussion raised three major issues: the absence of economic factors as determinants in the paper, the controversy of Hofstede's cultural dimensions and the measures of divergence and absence in the paper. We will respond to the discussant's comments one by one.

1. The absence of economic factors as determinants

In the discussion, Papadaki questions why our paper only included cultural dimensions as the explicative variables of international accounting differences. We have one theoretical reason and one methodological reason.

As the reviewer quoted, Hofstede wrote (2001, p. 1359) “... I never claimed that culture is the only thing we should pay attention to. In many practical cases it is redundant, and economic, political or institutional factors provide better explanations”. In our paper, we are conscious of the other approach of explaining international accounting differences by institutional economic factors. Our study focuses on cultural values, because (1) the majority of existing literature is dominated by studies using institutional economic factors, we propose an alternative explanation based on cultural values, as assessed with reference to the work of Hofstede (1980, 1991, 2001) and Schwartz (1994), and (2) recent literature in economics and finance (Greif, 1994; Landes, 2000; Stulz & Williamson, 2003) demonstrates that culture is a determinant of institutions. Concentrating on culture rather than on institutions reflects that culture precedes institutions.

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Another reason of excluding institutional/economic factors from our study is a methodological one. The discussant mentioned the works of Meek and Saudagaran (1990) and Saudagaran and Meek (1997): “The national accounting standards are the result of a complex interaction of cultural, historical, economic and institutional factors. Factors that can influence accounting development are: (1) the legal system, (2) the nature of the relationship between business enterprises and providers of capital, (3) the tax laws, (4) inflation levels, (5) political and economic ties, (6) the level of economic development, and (7) the level of education levels”. However, our study is country-based with only 50 observations. The inclusion of such an important number of determinants will pose a problem for the degrees of freedom in the regression. Besides, these factors are highly correlated between each other which creates a potential multi-collinearity issue.

2. The controversy of Hofstede’s cultural dimensions

The discussant noted that “Hofstede’s indices of culture have been a very controversial topic in many disciplines”, because of the non-generalisability of the results, because of the obsolescence of the study and because of its lack of comprehensiveness. We totally understand these criticisms.

However, again as the discussant mentioned, “although many critiques of Hofstede’s work have appeared in the literature, they did not diminish the attractiveness of his model which is still used by researchers in managerial studies”.

Because of these concerns on the possible measurement bias by using only Hofstede’s cultural dimensions as proxies in our study, we added in the revised version of our paper another set of cultural value measures from Schwartz (1994). This further investigation confirms that our results are quite robust, i.e. culture does play a role in explaining international accounting differences.

3. The measures of divergence and absence

The reviewer mentioned: “The measures of divergence and absence in DJS appear to be flawed since they put equal weight to all items of the International Accounting Standards. The considerable differences in compliance for different items suggest that firms and regulatory agencies treat these items very differently, and this might be an indication of their varying importance.”

In disclosure studies, the weighting of each disclosure item is potentially important. Cooke (1989, 1991, 1992, 1993), and many other authors (e.g. Ahmed & Nicholls, 1994; Archambault & Archambault, 2003; Chen & Jaggi, 2000; Hossain, Perera, & Rahman, 1995; Hossain, Tan, & Adams, 1994; Tai, Au-Yeng, Kwok, & Lau, 1990; Wallace, Naser, & Mora, 1994), are in favor of unweighted items, implying that each item is of equal importance. The major argument is that “one class of user will attach different weights to an item . . . than another class” and that “the subjective weights of user groups will average each other out” (Cooke, 1989, p. 115).

In our study, the indexes have been determined assuming that each of the 111 items has an equal weight. This assumption is standard in the literature and is also based on the difficulty involved in defining a specific weight for each item. However, we have re-run all tests with an alternative weighting scheme. We first group all items within a given IAS and determine “absence” and “divergence” indexes per IAS. For example, if a given IAS includes 10 items among the 111 studied, we compute for each country the number of “absent” and “divergent” items over 10. This determines a percentage of “absence” and “divergence” per IAS. We then compute a non-weighted average of these indexes on all the IAS, resulting in disclosure indexes where all the IAS have the same weight. Untabulated results show that inferences are not affected by this alternative weighting scheme.

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Differences in the valuation of earnings and book value: Regulation effects or industry effects?

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Abstract

This paper uses a valuation framework on a sample of firms from four European countries (France, Germany, Netherlands, and United Kingdom) to examine how income, accruals, and book value of equity are perceived by the respective capital markets. Our model includes adjustments for industry effects and taking into account the linear information dynamics of the accounting variables posited in the Ohlson model. Consistent with previous researchers, we find that both earnings and book value of equity have valuation implications and that there is significant dispersion in the country-specific and industry-specific valuation multiples. However, when using accounting variables to forecast market values we find that industry-specific valuation multiples reduce forecasting error more than country-specific ones.

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Keywords: Valuation; Country effects; Industry effects; Out-of-sample prediction

1. Introduction

In 1980, F. Black issued a provocative statement: accounting policies must be chosen so that earnings are useful in the valuation of a firm and, more specifically, that the earnings-price multiple should be constant across firms. It is well known however, that there is substantial variation in the average earnings-price multiple across countries although Land and Lang (2002) found that earnings multiples across countries became more similar over the years. In the present study, we investigate whether the systematic differences in the

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value relevance of the book value of equity and earnings found among European countries and reported in King and Langli (1998) and Arce and Mora (2002) may also be explained by economic factors such as industry effects. We go even further and ask whether one should regulate accounting at the national level (or, even the supra-national one, e.g., I.F.R.S.) or at the industry level by adopting industry-specific standards as the FASB or even European country regulators have done on a number of occasions in the past. We focus on four European Union (EU) countries. The EU offers an interesting context for such studies because a series of Directives were enacted in the 1980s to ensure that member states would harmonize their accounting policies. Still, generally accepted accounting principles vary substantially across countries. Consequently, a number of recent publications (inter alia, Arce & Mora, 2002; King & Langli, 1998) have examined the valuation implications of these differences.

The modeling approach used in this paper is based on Ohlson (1995) and Feltham and Ohlson (1995, 1996). This class of models “can best be understood as an attempt to restate economic theories of income measurement in the light of advances in the economics of asset pricing under uncertainty” (Walker, 1997, p. 341). The fundamental characteristics of Ohlson type models are characterized by the clean surplus assumption and linear information dynamics (Walker, 1997). Indeed, estimating variants of the Ohlson model imposes three types of constraints on the estimated equation:

“The first constraint is that all components of earnings have the same earnings forecasting coefficient and valuation multiple. The second constraint adds the additional restriction that earnings valuation multiples are identical across industries. The third constraint is that the theoretical structural relation underlying the valuation model is appropriate.” (Barth, Beaver, Hand, & Landsman, 2002, p. 1).

The purpose of this study is to provide evidence on the influence of these constraints in a cross-national context.

Several studies provide evidence that the first constraint is binding with regard to the cash flow and accrual components of income (e.g., Barth, Beaver, Hand, & Landsman, 1999; Dechow, 1994; Sloan, 1996). In particular, with relevance to the current study, Barth et al. (1999, 2002) show that total accruals and cash flow earnings components have different implications for forecasting abnormal earnings and for estimating equity market value in the context of Ohlson (1999). That is, disaggregating earnings into its accrual and cash flow components aids in forecasting abnormal earnings and explaining equity market value. We argue that different institutional environments for accounting regulation are likely to influence the accruals component only. Therefore, any systematic differences in accounting policies will be reflected in the valuation of accruals and not cash flows because cash flows should be valued at approximately the same rate based on economic conditions.

Barth et al. (1999, 2002) also provide evidence that the valuation of the accrual and cash flow components of earnings vary across industries. In the case where the researcher aims to identify differences in the valuation of earnings and book value across countries, constraining the valuation coefficients of earnings components (and book value) to be the same is even more important because economic conditions facing European countries are more likely to be reflected at the industry level rather than the macro level.

Finally, the third constraint regarding the structure of the model implies that the linear information model (LIM) describing the time-series evolution of earnings and other variables is descriptively valid. As Myers (1999, p. 26) observes, “linear models of the link between current and future information ensure consistency and are an integral component of accounting based valuation.” Therefore, ignoring the LIM in the estimation of the valuation equation is likely to lead to biased estimates. In addition, time-series properties of earnings are likely to differ between countries. For example, in countries with higher conservatism of accounting measures, accounting earnings will exhibit higher persistence.

Accordingly, we use data for a sample of firms from four European countries (France, Germany, Netherlands, and the United Kingdom) for the 9-year period from 1995 to 2003 to examine how their accounting income and book value of equity are perceived by the respective capital markets. This paper extends previous studies of the effect of different regulatory regimes on the valuation implications of accounting income and book value of equity by taking into account the time-series properties of the key accounting variables posited in the Ohlson model, industry effects, and by distinguishing between the accruals and cash flows components of earnings.

To evaluate the influence of these two variables we investigate their explanatory power for observed market values and also the forecasting power of the estimated models for out-of-sample companies. Our focus on the predictive ability of alternative definitions of the model is consistent with the expectation that accounting data should help predict future cash flows and consecutively market prices. At the same time, using predictive ability as a criterion is consistent with the requirement that valuation parameters be constant cross-sectionally. Finally, scale induced bias in the estimated coefficients causes heteroscedasticity and this suggests that R^2 cannot be used as the primary criterion for evaluating differences in the value relevance of accounting data.

Consistent with previous studies, we find that earnings and book value of equity in both models studied, as well as accruals in the second one, have valuation implications, that there are significant country-specific differences in the valuation of these variables, but that industry effects are a more important source of variation in the capitalization rates.

The remainder of the paper is organized as follows: In the next section, we describe the clean surplus valuation models used in our study and develop the testable hypotheses. Subsequently we describe the sample and data used in our tests, and present our findings. The final section summarizes and concludes the study and presents ideas for further research.

2. Clean surplus valuation models

Previous research implicitly accepted the prediction of market value as the criterion for judging alternative models. In this paper, we investigate whether alternative specifications of the estimated equation that are more consistent with the theoretical model or specifications that use more information lead to different conclusions regarding differences in the valuation parameters among EU member states.

As stated in the Introduction, a major constraint in the estimated valuation models is the theoretical structure of the Ohlson model. For this reason, consistent with Barth et al. (1999, 2002) we use a generalized version of the Ohlson (1999) model to develop predictions of the way in which book value of equity and earnings and then a decomposition of earnings into cash flow and accruals relate to stock market prices. In doing so, we examine two linear information models (LIMs). The first model, LIM1, is based on Feltham and Ohlson (1996) and has been frequently used in accounting research. It comprises three equations, where Eqs. (1) and (2) are forecasting equations, and Eq. (3) is the implied-valuation equation based on the linear information dynamics of the forecasting equations.

Pooling observations cross-sectionally requires the assumption that “the security price–earnings relation is both positive and homogeneous over the entire range of earnings realizations” (Collins, Pincus, & Xie, 1995, p. 30). Hayn (1995) and Collins et al. (1995) document a non-homogeneous price–earnings relationship across profit-and-loss firms. These effects are mitigated by the inclusion of the book value of equity as an independent variable in the valuation equation. However, estimates of the earnings coefficient in the valuation equation may still be biased. For this reason, we also report results for the positive earnings sub-sample.

Accordingly, LIM1 is defined as follows:

$$NI_{it}^z = \omega_{10} + \omega_{11}NI_{it-1}^z + \omega_{12}BOOK_{it-1} + \varepsilon_{1it} \quad (1)$$

$$BOOK_{it} = \omega_{20} + \omega_{22}BOOK_{it-1} + \varepsilon_{2it} \quad (2)$$

$$MV_{it} = v + \alpha_1 NI_{it}^z + \alpha_2 BOOK_{it} + \varepsilon_{3it} \quad (3)$$

where MV is market value of equity, NI^a is abnormal income defined as earnings less the normal return on equity book value, $BOOK$ is the book value of common equity, v can be interpreted as including the effects of “other information” in Ohlson (1995), the ε ’s are error terms and the i, t subscripts denote firm-year observations. This model implicitly assumes all components of earnings carry equal weight in forecasting abnormal earnings and hence equal weight in the valuation equation as well. Previous research on the cross-national differences in the valuation of earnings and book value estimated Eq. (3) assuming no influence from the time-series properties of the accounting variables.

The second model, LIM2, which once again is based on the model in Barth et al. (1999), relaxes the constraint that total accruals and cash flow components of earnings have the same valuation implications. This model is particularly important in the context of our research, since, if differences in valuation parameters identified in previous research simply reflect differences in GAAP among the national settings examined, these should be reflected in the accruals component only. LIM2 comprises four equations, where Eqs. (4)–(6) are forecasting equations, and Eq. (7) is the valuation equation implied by the linear information dynamics of the forecasting equations. Relative to LIM1, LIM2 imposes an

additional restriction upon the valuation parameters by adding an additional forecasting equation.

$$NI_{it}^z = \omega_{40} + \omega_{41}NI_{it-1}^z + \omega_{42}ACC_{it-1} + \omega_{43}BOOK_{it-1} + \varepsilon_{4it} \quad (4)$$

$$ACC_{it} = \omega_{50} + \omega_{51}ACC_{it-1} + \omega_{53}BOOK_{it-1} + \varepsilon_{5it} \quad (5)$$

$$BOOK_{it} = \omega_{60} + \omega_{61}BOOK_{it-1} + \varepsilon_{6it} \quad (6)$$

$$MV_{it} = v + \alpha_1NI_{it}^z + \alpha_2ACC + \alpha_3BOOK_{it} + \varepsilon_{7it} \quad (7)$$

where ACC is the total accrual component of earnings. Although we use the same notation for coefficients and error terms in both LIMs to facilitate exposition, most likely the estimated coefficients will differ.

In estimating the two models we assume that there is contemporaneous correlation in the error terms of the equations in each model and use the maximum likelihood estimator of Zellner's Seemingly Unrelated Regression (SUR). Consistent with Barth and Kallapur (1996) and Barth et al. (2002) we estimate all equations without scaling the data. We report robust standard errors estimated using the consistent covariance matrix estimator to address heteroscedasticity problems.

2.1. Valuation relevance research and its implications for international accounting harmonization

Previous research investigating cross-national differences in the valuation implication of financial statement items is rather limited despite recent calls for more international accounting research (Meek & Thomas, 2003). Furthermore, the issue of differences in the valuation of accounting data has important public policy ramifications. When research studies provide evidence about differences in the "information content of accounting data under different GAAP, this helps to justify the process of harmonization" (Pope, 1993).

The European Union, in many respects, offers a unique setting to study the effects of information-content differences. EU member states have agreed to a minimum set of rules that harmonize financial statements including the "true and fair" principle. In fact, there are many differences which remain that can be attributed to cultural factors such as corporate-governance mechanisms as well as institutional ones that refer to the influence of tax authorities on financial-reporting. It should also be noted that EU member states try to coordinate their economic policies and are each others' most important trading partners. They have already taken a number of steps to integrate their financial markets. This implies that there are many common fundamentals driving their financial markets.

The first study to examine the capital markets of accounting-policy differences in the context of the European Union was Joos and Lang (1994), who used returns and price models to examine the effects of accounting diversity in the European Union. They found

evidence of significant differences in the stock market valuation of accounting data which are consistent with the cross-country differences in reporting philosophies.

More recently, King and Langli (1998) and Arce and Mora (2002) used ad hoc variants of the Ohlson (1995) model and both concluded that there are significant differences in the value relevance of accounting data among the European countries studied. Both papers used Theil's decomposition of the coefficient of determination (R^2) to examine whether earnings and book value of equity explained market capitalization.

King and Langli (1998) used data for three countries while Arce and Mora (2002) used data from eight countries. Both papers include one country in the sample that is not an EU member (Norway and Switzerland, respectively) and, therefore, is subject to a very different regulatory regime. Furthermore, both these countries, for their own reasons, stand aloof from EU developments and are therefore subject to different economic fundamentals as well. Thus, their presence in the two samples may be confounding the results.

Both papers concluded that "earnings seem to be more value relevant than book value in market-oriented countries, and vice versa in creditor-oriented countries" and that "results show that both earnings and book value convey additional information having incremental explanatory to explain market prices" (Arce & Mora, 2002, p. 595). In particular, King and Langli (1998) concluded that German accounting data, which are not prepared with the needs of capital markets participants in mind, are less value relevant than that in the United Kingdom and Norway, the two other countries in their sample, and that book value of equity explains more of the variance in market prices than earnings in Germany but less in the other two countries.

Cross-country value relevance results are being used to justify further harmonization of accounting policies internationally. This usage can be criticized on many grounds — from the purely technical to the more fundamental relating to the use of accounting information in various institutional contexts.

At the technical level, it can be argued that previous studies have used a limited version of the Ohlson model since they did not take into account the information dynamics assumptions of the model. In the present paper, we attempt to address this problem. Furthermore, data from different national contexts violate both the clean surplus relationship and the unbiased accounting assumptions of the Ohlson model although the results of Hand and Landsman (1999) suggest that the violation of the clean surplus assumption should have limited effects on the results.

Furthermore, focusing on which variable, earnings, or book value is more value relevant violates, at least partly, the spirit of the Ohlson model which is, according to Walker (1997, p. 352), that "a two dimensional model of the firm (i.e., in terms of earnings and book value) is demonstrably superior to a single dimensional representation (i.e., in terms of earnings only)."

A more fundamental criticism is that value relevance studies, including the present one, take an impoverished and decontextualized view of accounting. Clearly, there is more information in the financial statements than earnings and book value and it is being used by investors. Furthermore, companies disseminate information using channels other than financial statements. This information clearly influences how data in financial statements are evaluated. Nevertheless, these two key figures are frequently treated as a benchmark of company performance and investment-selection criteria by most investors.

Finally, accounting harmonization is about applying the same or at least similar recognition and measurement rules for the preparation of financial statements. Information provided therein is used for resource allocation and distribution decisions and therefore financial statements must serve multiple purposes including, *inter alia*, control, corporate governance, taxation, regulatory requirements, evaluation of the stewardship of a company's resources, and investment analysis. Since national economic and social systems (which drive demand for accounting information) differ, properties of accounting information by necessity will differ. Thus, value relevance research, which by definition focuses on the use of accounting information for investment selection, can provide only a partial picture.

2.2. National differences

Two basic properties of accounting income are conservatism and timeliness. Timeliness of accounting income refers to the extent to which current-period income incorporates contemporaneous economic income while conservatism is defined as the extent to which there is an asymmetric requirement for the recognition of good news versus bad news (Basu, 1997). These two properties capture most of what is commonly referred to as "transparency" of the financial statements. Ball, Kothari, and Robin (2000) argue that differences in the demand for accounting income in different institutional contexts cause its basic properties to vary internationally.

In our study, we focus on four European countries, France, Germany, the Netherlands, and the United Kingdom, all European Union members. We chose these countries because they represent distinct national accounting systems (Choi, Frost, & Meek, 2002) whose influence extends beyond their borders. Two of these countries (France and Germany) are fundamentally code-law countries, the United Kingdom is mainly a common-law one, while the Netherlands is technically a code-law country but its accounting framework is strongly influenced by the relationship of the Dutch profession with the academia and the research conducted therein.

In the Appendix we present financial regulations of the countries in the sample as described by Choi et al. (2002). However, national accounting standards do not give a complete picture of accounting practice in each country. As Ball et al. (2000, p. 4) argue, much accounting practice is not determined by accounting standards because practice is more detailed than standards, standards lag innovations in practice, and because companies do not invariably follow standards. It is therefore likely that companies that belong to the same economic sector follow more similar accounting policies in terms of timeliness and conservatism and therefore the variation in the valuation multiples of earnings and book value may be better captured if we focus on economic sector groups rather than country ones.

With regard to the basic properties of accounting income, Ball et al. (2000) find that accounting income is substantially less timely and less conservative in code-law countries than in common-law countries. In their sample, however, they find that among common-law countries accounting income is least conservative in the United Kingdom, possibly because of the influence of EU regulations. Thus, overall, all countries in our sample have accounting income that is characterized by lower asymmetrical conservatism than common-law

countries such as the United States. Consequently, book value of equity will be characterized by lower conservatism as well. These results suggest that we can rely on the conservatism properties of accounting data to formulate *ex ante* hypotheses about the relative valuation relevance of earnings and book value in the countries of our sample. These results also suggest that timeliness in the recognition of current economic income is the distinguishing characteristic of the accounting systems of the four countries in our sample.

2.3. Testable hypotheses

Previous research has documented that book value and income have differential valuation implications and thus both contain valuable information for the valuation of equity securities. In this paper, we examine the persistence of differences among countries in the value relevance of book value of equity versus earnings after adjusting for industry effects. In a time-series context, Collins, Maydew, and Weiss (1997) suggest that changes in investment in intangibles, nonrecurring items, losses, and firm size may explain the observed differences. In addition, companies may be operating under the same regulatory regime but follow different accounting policies as influenced by the markets they operate in and/or the reporting practices of their competitors, which are not necessarily their next-door neighbors. Some of these influences may be captured by examining the value relevance of earnings and book value in an industry-specific context as opposed to a country-specific one. Indeed, Barth et al. (2002) have documented in a U.S. context that partitioning the firms into industry-specific groupings leads to superior forecasts of the market value of equity as opposed to constraining all firms to have the same model parameters. We also investigate whether the differences across countries in the valuation coefficients of earnings identified in previous studies affect only the accruals-adjustment component of earnings.

Heterogeneity across countries for a given LIM can arise for two reasons. The first is the difference in the economic conditions in each country studied while the second is the regulatory regime that influences how a company's cash flows are mapped into accounting variables. To the extent that firms within the same country face similar economic conditions, including cost of capital, and have similar accounting practices, including level of conservatism and timeliness, valuation parameters for firms within a country will be the same, but coefficients may vary across countries as a result of differences in the economic environment and accounting regulations.

This leads to the following hypotheses (in alternative form):

H_{A1}. There are country-specific differences in the valuation of earnings and book value of equity.

Operationally, this hypothesis means that the estimated parameters for earnings and book value in Eqs. (3) and (7) will differ between countries after pooling across industries and adjusting for the linear information dynamics of the accounting variables. For results to be consistent with prior research, the value of the R^2 of the valuation equation should vary systematically in accordance to the regulatory regime in each country studied; i.e. it should be higher in countries where the accounting system has an investor orientation (the Netherlands and the United Kingdom).

Barth et al. (2002) found that including the accruals component separately in their valuation equation improved its forecasting performance. Accordingly, we use LIM2 to investigate the following two hypotheses about the accruals adjustment:

H_{A2}. The accruals adjustment is valued at a different rate from earnings after adjusting for country effects.

We evaluate this hypothesis by estimating LIM2 separately for each country in the sample and testing whether the estimated coefficients for residual earnings and accruals in Eq. (7) differ across countries in a statistically significant sense.

Heterogeneity across industries for either of the two models can also arise for two reasons. The first is the result of actual differences across industries in the nature of their business. For example, service firms do not have substantial inventories. The second source of heterogeneity arises from industry-specific differences in the persistence of earnings, which may be due to seasonality of demand, credit terms with customers and suppliers, and so on. To the extent that firms within the same industry face similar economic conditions, including cost of capital, and have adopted similar accounting practices that are not influenced by their domicile, valuation parameters for firms within a specific industry will be the same. Obviously, coefficients can differ between industries as a result of differences in the economic environment and accounting practices.

This leads to the following two hypotheses (in alternative form):

H_{A3}. There are industry-specific differences in the valuation of earnings and book value of equity.

This hypothesis implies that the estimated parameters for earnings and book value in Eqs. (3) and (7) will differ between industries after pooling across countries and adjusting for the linear information dynamics of the accounting variables.

Corresponding to our country analysis, we evaluate the following hypothesis on an industry-specific analysis.

H_{A4}. The accruals adjustment is valued at a different rate from earnings after adjusting for industry effects.

This hypothesis implies that the estimated coefficients for residual earnings and accruals in Eq. (7) are different in a statistically significant sense when estimating LIM2 for every industry in the sample.

Finally, we address the fundamental question of this paper, namely, whether there is less error in the estimates of a company's market value when using valuation multiples estimated in a country-specific context versus an industrial-sector one. Initially, we test for the forecasting power of LIM1.

H_{A5}. LIM1 leads to superior forecasts of the market value of equity after adjusting for industry effects than after adjusting for country effects.

This hypothesis implies that the errors in the forecast of the market value of each company generated using industry-specific estimates of LIM1 will be smaller than if LIM1 was estimated by country.

The second valuation model, LIM2, has a finer set of accounting variables including an adjustment for accruals. Consequently, we investigate whether forecast errors generated using industry-specific estimates of LIM2 are smaller than when LIM2 is estimated by country:

H_{A6}. LIM2 leads to superior forecasts of the market value of equity after adjusting for industry effects than after adjusting for country effects.

To test H_{A5} and H_{A6}, we generate test statistics from the forecast errors. First, we estimate LIM1 and LIM2 on a sample pooled across countries and industries. The estimated valuation equation includes dummy variables for year, industry, and country effects. Implicitly, these equations require the estimated coefficients (valuation multiples) to be constant across both countries and industries as well as over time. We then estimate each of the two LIMs separately, for each economic sector, allowing for country fixed-effects captured by dummy variables in the valuation equation. Finally, we pool firms within the same country allowing for industry fixed-effects in the valuation equation modeled by dummy variables.

Both LIMs are estimated cross-sectionally. Barth and Kallapur (1996) have argued that when estimating such models, there are cross-sectional scale differences “that can result in biased coefficient estimates and heteroscedastic regression errors” (p. 528). Barth and Clinch (2004) suggest that the causes of scale differences are additive and/or multiplicative correlated omitted variables, scale-varying valuation parameters, and scale-related heterogeneity. Consistent with Barth and Kallapur (1996), to investigate scale problems in the estimated valuation equation we included size proxies and more specifically per value of equity and sales. We found that this had limited effect on the estimated coefficients and negligible on forecasting performance. This suggests that scale effects are unlikely to be affecting our conclusions.

For each model or specification we study, we generate a distribution of the absolute percentage forecast errors (absolute value of the difference of the predicted value less than the actual one over the actual one). We then use the nonparametric Wilcoxon matched pairs signed-rank test to assess the statistical significance of differences in the following three pairs of error distributions:

1. fixed-effects model pooled across industries and countries versus country-specific estimates
2. fixed-effects model pooled across industries and countries versus industry-specific estimates
3. country-specific estimation versus industry-specific estimation.

These comparisons allow us to determine for a given level of earnings decomposition (i.e. LIM1 and LIM2) whether industry or country effects are more influential in forecasting equity market values.

2.4. Sample and variables' definitions

We use data extracted from Standard and Poor's Global Vantage database for all non-financial companies domiciled in France, Germany, the Netherlands, and the United

Kingdom, quoted in the respective national stock exchange and with December accounting year-end for the 9-year period 1995–2003. In accordance with previous studies in the area (Arce & Mora, 2002; King & Langli, 1998), to mitigate the effects of outliers, we treat as missing observations those that are in the extreme top and bottom one percentile, by year and within each country and industry group, for market and book value of equity and earnings. Furthermore, we require sample firm-years to have full data to estimate each information dynamics and market-valuation equation, which results in a sample common to both LIM. Consequently our sample consists of 5957 firm-year observations. In the cases of France, Germany, and the Netherlands, all variables are expressed in millions of euros (by default). Data for U.K. companies were converted to euros using contemporaneous exchange rates.

More specifically the variables used in this study are:

- Market value:** the total market value of all classes of common equity at accounting year-end. Although Barth and Clinch (2001) recommend estimating variants of the Ohlson model on a per-share basis, this is impractical for European companies which issue more than one class of ordinary shares.
- Residual income (N_{it}^{res}):** defined as income available to ordinary shareholders, i.e., after adjusting for minority interests and preferred dividends less a normal return on book value of equity which was assumed to be 12% as in previous studies. The use of a common cost of capital for all the countries in our sample may be a source of bias but can be justified because, over the period studied, the average yield-to-maturity of 10-year bonds was approximately the same in all four countries. Consistent with previous research (e.g., Barth et al., 2002; Dechow, Hutton, & Sloan, 1999), we exclude extraordinary items. Disclosure and measurement rules for extraordinary items differ substantially among the countries in our sample and, therefore, if one looked at earnings before extraordinary items one would focus on ex ante non-comparable items. Furthermore, this limits the risk that estimation results are influenced by large one-off items. Nevertheless, it must be noted that exclusion of extraordinary items is inconsistent with the clean surplus assumption of Ohlson (1995).
- Book value of equity (BOOK):** defined as share capital and reserves but excluding preference capital.
- Accruals (ACC):** measured as the difference between net income less operating cash flow as reported in the cash flow statement. A problem with identifying the accrual adjustment in a European context is that most non-UK companies did not publish a cash flow statement until recently. Nevertheless, we chose to use data from the cash flow statement because, as Hribar and Collins (2002) report, studies that use changes in balance-sheet accounts to estimate accruals are possibly contaminated by measurement error.

Although the definition of country is not problematic, industry classification clearly is (Bjorraj, Lee, & Oler, 2003). We classify companies in economic sectors (Consumer discretionary, Consumer staples, Health care, Industrials, Information technology, Materials, and Other, which includes: Telecommunication services, Utilities, and Energy¹)

¹ The number of company years in these three sectors is small (especially Telecommunications and Energy), which made estimation of the models for each of these sectors difficult because of the limited number of degrees of freedom.

Table 1

Frequency table of industry by country classification of number of firm-year observations

Sector	Country				Total
	France	Germany	Netherlands	United Kingdom	
Consumer discretionary	299	335	138	565	1337
Consumer staples	165	127	101	130	523
Health care	72	121	10	116	319
Industrials	376	550	283	793	2002
Information technology	239	343	92	230	904
Materials	146	177	74	191	588
Other	76	65	14	129	284
Total	1373	1718	712	2154	5957

as reported in Global Vantage. We focus on these sectors to balance the objective of enhancing homogeneity of firms within each industry grouping so that we can plausibly argue that valuation parameters may differ because of industry-specific economic conditions, and asset and liability structures, as well as accounting practices, with the constraint of having a minimum number of sample firms within each industry classification. It should be noted that previous research (Bjorajraj et al., 2003) has identified the S and P classification as superior to other schemes for research purposes.

Table 1 presents the industry and country composition of our sample. As can be seen, most of the observations are from companies domiciled in Germany and the United Kingdom, the two countries which represent the two "extreme" applications of code-law and common-law to financial-reporting, respectively.

Table 2 shows summary statistics of the core variables by country and industry. As can be observed, there is substantial variability in the size of the companies studied depending on the origin of the companies in the sample. In particular, the median market value of Dutch and British companies is larger than that of French and German ones, although the biggest companies by market value are French. Furthermore, Table 2 reveals that, on average, the market value of equity exceeds book value. This result indicates that the book value of equity is insufficient to explain market value of equity alone and therefore market value also reflects capitalized earnings.

Finally, Table 3 contains Pearson and Spearman correlations of the variables. We note that the book value and residual income variables are not correlated (Pearson's statistic) at a statistically significant level. This result confirms that the two variables provide complementary information for explaining market prices.

3. Results

In Tables 4 and 5 we present estimation results for the LIM1 and LIM2 models, respectively. More specifically, the first panel in each table reports results for the valuation equation, while in the second panel results for the information dynamics equations are presented.

Within each panel, the first line reports results obtained from estimation of a country, industry, and year fixed-effects regression in which all available observations are pooled.

Table 2

Summary statistics by country and by sector

		Mean	S.D.	Median	Min	Max
<i>Panel A: country statistics</i>						
France	MV	1725.63	4992.69	150.31	2.01	53,848.18
	BOOK	697.91	1675.37	83.16	-18.74	13,134.10
	NI ²	-6.17	118.48	-1.02	-1525.73	1426.56
	ACC	-110.38	361.61	-9.61	-4203.30	515.00
Germany	MV	837.40	2574.77	99.40	1.23	31,670.23
	BOOK	362.35	994.38	63.26	-6.63	13,815.90
	NI ²	-0.64	80.88	-2.96	-796.48	843.17
	ACC	-87.02	375.46	-9.38	-4883.00	1203.00
Netherlands	MV	1342.40	3345.28	227.66	3.81	44,282.64
	BOOK	404.14	751.59	129.19	1.06	5142.00
	NI ²	7.82	104.94	3.23	-692.41	767.68
	ACC	-70.43	180.08	-11.22	-1910.00	258.72
United Kingdom	MV	967.44	2630.89	186.60	2.96	35,581.94
	BOOK	394.60	936.74	83.77	-167.04	8906.93
	NI ²	-3.53	103.96	-0.27	-1023.86	783.43
	ACC	-71.73	205.73	-12.10	-3521.60	396.78
<i>Panel B: sector statistics</i>						
Consumer discretionary	MV	1227.22	2921.58	149.17	1.69	31,123.77
	BOOK	551.22	1290.89	84.49	-167.04	11,729.00
	NI ²	-0.74	110.30	-0.61	-960.24	906.15
	ACC	-110.82	380.01	-11.82	-4637.00	1203.00
Consumer staples	MV	2223.50	5343.92	252.00	2.70	53,848.18
	BOOK	638.03	1211.14	108.43	0.00	7609.50
	NI ²	19.24	96.93	1.13	-730.68	569.36
	ACC	-124.37	342.15	-15.46	-3521.60	1039.00
Health care	MV	1715.17	5619.56	167.17	2.81	51,932.38
	BOOK	442.60	996.07	72.91	0.17	9753.00
	NI ²	13.11	125.67	-4.11	-263.44	1426.56
	ACC	-41.34	110.92	-5.73	-748.97	515.00
Industrials	MV	650.77	1480.27	170.43	1.50	16,997.90
	BOOK	297.11	609.78	87.15	-20.91	7843.68
	NI ²	-4.27	73.34	0.00	-1023.86	717.98
	ACC	-52.75	144.50	-11.21	-1424.80	759.01
Information technology	MV	554.96	2318.52	54.55	1.23	44,282.64
	BOOK	126.80	420.95	31.05	-36.01	4553.46
	NI ²	-14.67	66.73	-3.51	-1030.36	187.69
	ACC	-17.65	73.08	-4.31	-1157.00	251.00
Materials	MV	1512.78	3862.74	168.87	3.30	31,670.23
	BOOK	858.01	1900.85	141.87	3.46	13,815.90
	NI ²	-4.57	128.24	-0.81	-915.15	783.43
	ACC	-141.74	316.06	-20.71	-2634.25	555.41
Other	MV	2826.48	6620.75	276.97	3.95	53,399.84
	BOOK	1030.46	2098.13	185.04	-40.70	13,134.1
	NI ²	-1.26	193.59	-2.37	-1525.73	843.17
	ACC	-262.01	739.05	-34.13	-4883	313.4

Table 3

Spearman's (Pearson) correlations, above (below) the diagonal

Variable	MV	BOOK	NI ²	ACC
MV	1.000	0.870*	0.292*	−0.509*
BOOK	0.767*	1.000	0.135*	−0.568*
NI ²	0.254*	−0.006*	1.000	0.099*
ACC	−0.594*	−0.711*	0.074*	1.000

* Significant at the 1% level.

The following six lines report statistics (average, standard deviation, maximum, minimum, number of significant positive, and negative) about the coefficients obtained in country-specific estimations with industry and year fixed-effects. The last six lines in each panel report the same statistics about the coefficients obtained in industry-specific estimations with country and year fixed-effects. These statistics are presented to provide descriptive evidence on the magnitudes, signs, and significance of the estimated parameters which are used in subsequent tests as well as to facilitate comparison with previous research.

3.1. Valuation equation results

Findings relating to the valuation equation of both LIMs are consistent with prior research (Barth et al., 1999, 2002) and expectations. More specifically, in the case of LIM1 (Table 4, panel A) the coefficient of residual earnings, α_1 , is positive and significant in the pooled sample, for three out of four countries (except Germany) and for six out of seven industry groups (excluding the information technology category). The valuation coefficient on book value of equity, α_2 , is significantly positive in the pooled sample and all country and industry settings. The large range in coefficient estimates across countries (for example, α_1 ranges from 5.864 to 19.396) and across industries (α_1 ranges from 8.226 to 22.704) is prima facie evidence that prediction of the market value of equity based on separate country or industry estimation may contain smaller errors than those based on the pooled estimates.

Results relating to LIM2 as evidenced in panel A of Table 5 are also consistent with previous research. It is noteworthy that separating accruals has the effect that the valuation coefficient on earnings is significant and positive in all country and industry settings in LIM2, although accruals is a significant variable in the case of Germany and the United Kingdom and the industrials and materials sectors. This suggests that accruals in these two countries provide additional information that is valuable to investors incremental to residual earnings.² The low significance of accruals in most sectors does not confirm in a European context the results of Barth et al. (1999, 2002) who found that accruals is a highly significant variable. The result, that accruals is a significant variable in the case of the two countries where accounting differs most, cannot be reconciled with differences in

² When estimating LIM2 separately by country and by industry we also tested whether a restriction that the coefficients on earnings and accruals are equal (but of opposite signs) is statistically significant. Results show that these two variables have different valuation multiples, and add to the result that accruals have incremental information content relative to abnormal earnings.

Table 4

Summary results for LIM1

Panel A: Summary statistics from regressions of market value of equity on earnings and book value of equity:

$$MV_{it} = \alpha + \alpha_1 NI'_{it} + \alpha_2 BOOK_{it} + \varepsilon_{3it}$$

	α_1		α_2		R^2
	Coefficient	z-statistics	Coefficient	z-statistics	
Pooled fixed effects	13.109	7.60*	2.361	22.96*	0.65
Across countries					
Mean	12.113		2.543		0.66
S.D.	5.574		0.420		
Maximum	19.396		3.160		
Minimum	5.864		2.2238		
No. significantly positive	3		4		
No. significantly negative	0		0		
Across industries					
Mean	12.882		2.932		0.70
S.D.	4.782		1.123		
Maximum	22.704		4.730		
Minimum	8.226		1.813		
No. significantly positive	6		7		
No. significantly negative	0		0		

Panel B: Summary statistics from regressions of earnings on lagged earnings and book value of equity:

 $NI'_{it} = \omega_{10} + \omega_{11} NI'_{it-1} + \omega_{12} BOOK_{it-1} + \varepsilon_{1it}$ and regressions of book value of equity on lagged book value of equity:

$$BOOK_{it} = \omega_{20} + \omega_{22} BOOK_{it-1} + \varepsilon_{2it}$$

	ω_{11}		ω_{12}		R^2	ω_{22}		R^2
	Coefficient	z-statistics	Coefficient	z-statistics		Coefficient	z-statistics	
Pooled fixed effects	0.283	5.43*	-0.008	-1.97**	0.18	1.009	45.39*	0.93
Across countries								
Mean	0.310		-0.008		0.23	1.008		0.92
S.D.	0.155		0.012			0.089		
Maximum	0.519		0.001			1.069		
Minimum	0.146		-0.025			0.875		
No. significantly positive	3		0			4		
No. significantly negative	0		1			0		
Across industries								
Mean	0.318		-0.014		0.28	1.008		0.91
S.D.	0.174		0.037			0.049		
Maximum	0.683		0.035			1.070		
Minimum	0.152		-0.086			0.910		
No. significantly positive	6		1			7		
No. significantly negative	0		4			0		

* Significant at the 1% level.

Table 8
Summary results for LIM2

	Panel A: Summary statistics from regressions of market value of equity on earnings, accruals, and book value of equity: $MV_{i,t} = \alpha_0 + \alpha_1 NI_{i,t} + \alpha_2 ACC_{i,t} + \alpha_3 BOOK_{i,t} + \varepsilon_{i,t}$				Panel B: Summary statistics from regressions of earnings on lagged earnings and book value of equity: $NI_{i,t} = \alpha_0 + \alpha_1 NI_{i,t-1} + \alpha_2 ACC_{i,t-1} + \alpha_3 BOOK_{i,t-1} + \varepsilon_{i,t}$			
	α_1	α_2	α_3	R^2	α_1	α_2	α_3	R^2
Pooled fixed effects	11.671	0.847	1.46	0.67	11.34*	0.152	0.042	0.93
Across countries								
Mean	11.456	2.076	2.115	0.70	0.478	0.196	0.042	0.92
S.D.	2.795	3.549	0.668		0.164	0.086	0.017	
Maximum	14.687	2.463	2.660		0.686	0.107	0.086	
Minimum	-7.88*	6.069	1.273		0.290	0.287	-0.024	
No. significantly positive	4	0	4		4	0	0	
No. significantly negative	0	2	0		0	4	4	
Across industries								
Mean	12.788	4.042	2.462	0.72	0.523	-0.229	-0.044	0.91
S.D.	4.246	3.648	1.150		0.203	0.126	0.033	
Maximum	20.490	0.268	3.765		0.948	0.106	0.005	
Minimum	8.216	-10.288	0.962		0.345	-0.434	-0.106	
No. significantly positive	7	0	7		7	0	0	
No. significantly negative	0	2	0		0	6	6	

Panel B: Summary statistics from regressions of earnings on lagged earnings and book value of equity: $NI_{i,t} = \alpha_0 + \alpha_1 NI_{i,t-1} + \alpha_2 ACC_{i,t-1} + \alpha_3 BOOK_{i,t-1} + \varepsilon_{i,t}$. regressions of accruals on the lagged values of accruals and the book value of equity: $ACC_{i,t} = \alpha_0 + \alpha_1 ACC_{i,t-1} + \alpha_2 NI_{i,t-1} + \alpha_3 BOOK_{i,t-1} + \varepsilon_{i,t}$. regressions of book value of equity on lagged book value of equity: $BOOK_{i,t} = \alpha_0 + \alpha_1 BOOK_{i,t-1} + \alpha_2 NI_{i,t-1} + \alpha_3 ACC_{i,t-1} + \varepsilon_{i,t}$.

	Panel C: Summary statistics from regressions of earnings on lagged earnings and book value of equity: $NI_{i,t} = \alpha_0 + \alpha_1 NI_{i,t-1} + \alpha_2 ACC_{i,t-1} + \alpha_3 BOOK_{i,t-1} + \varepsilon_{i,t}$				Panel D: Summary statistics from regressions of earnings on lagged earnings and book value of equity: $NI_{i,t} = \alpha_0 + \alpha_1 NI_{i,t-1} + \alpha_2 ACC_{i,t-1} + \alpha_3 BOOK_{i,t-1} + \varepsilon_{i,t}$			
	α_1	α_2	α_3	R^2	α_1	α_2	α_3	R^2
Pooled fixed effects	0.453	0.152	0.042	0.35	0.453	0.152	0.042	0.35
Across countries								
Mean	0.478	0.196	0.042	0.35	0.478	0.196	0.042	0.35
S.D.	0.164	0.086	0.017	0.35	0.164	0.086	0.017	0.35
Maximum	0.686	0.107	0.086	0.35	0.686	0.107	0.086	0.35
Minimum	0.290	0.287	-0.024	0.35	0.290	0.287	-0.024	0.35
No. significantly positive	4	0	0	4	4	0	0	4
No. significantly negative	0	4	4	0	0	4	4	0
Across industries								
Mean	0.523	-0.229	-0.044	0.37	0.523	-0.229	-0.044	0.37
S.D.	0.203	0.126	0.033	0.37	0.203	0.126	0.033	0.37
Maximum	0.948	0.106	0.005	0.37	0.948	0.106	0.005	0.37
Minimum	0.345	-0.434	-0.106	0.37	0.345	-0.434	-0.106	0.37
No. significantly positive	7	0	0	7	7	0	0	7
No. significantly negative	0	6	6	0	0	6	6	0

* Significant at the 1% level

the demand for earnings' properties among code-law versus common-law countries identified in Ball et al. (2000).

3.2. Cross-country differences

To test HA1 and HA2 we estimated LIM1 and LIM2 separately by country. For both models, accounting variables have the highest explanatory power (as measured by R^2) for German market equity values (0.82 and 0.83, respectively). Thus, our results differ from previous studies in the sense that the models perform best in Germany, a code-law country. This can perhaps be explained because, in contrast to previous research, our research design takes into account information dynamics and jointly estimates the information dynamics equations with the valuation one. When the accruals variable enters the valuation model in LIM2, there is almost no change in the value of the R^2 of the valuation equation for France, Germany, and the Netherlands but there is a substantial increase in the case of the United Kingdom.

To formally evaluate our first two hypotheses (HA1 and HA2) for the equality of the valuation multiples across countries we used the Wald test assuming that country populations are independent. Results reject the hypothesis that the coefficient on earnings is the same across countries both in the case of LIM1 at the 10% level and LIM2 at the 5% level and that the coefficient on accruals is the same across in LIM2 at the 0.1% level. However, we cannot reject the hypothesis that the valuation coefficient on book value of equity is the same across countries in the case of LIM1 at any conventional level of significance, while in the case of LIM2, this is true only at the 5% level.

3.3. Cross-industry differences

To formally test HA3 and HA4 we estimated LIM1 and LIM2 separately by industry. Again we observe wide variation in the value of the R^2 of the valuation equation, but the average R^2 for both models are marginally higher than when the model is estimated on a country basis. The sector where our models have the lowest explanatory power for market equity values is the consumer discretionary sector for both specifications and the highest is the health care sector.

To formally evaluate HA3 and HA4 we used the Wald test for the equality of the estimated coefficients across industries, assuming that industry populations are independent. Our results reject both hypotheses for the linear information dynamics models. More specifically, our results indicate that the valuation multiple on earnings and equity differs across industries for both models and on accruals for LIM2 at least at the 1% level of significance.

3.4. Information dynamics results

Findings relating to the information dynamics equations in both LIM1 and LIM2 show that there are substantial differences in the explanatory power of these equations.

Book equity in both LIMs exhibits strong autoregressive behavior and it should be noted that, given the nature of the estimation procedure used, estimated coefficients are

almost identical. The estimated coefficient of the lagged value of book equity is significantly positive in all country and industry contexts.

In the case of abnormal earnings, the explanatory power of the estimated equation for both LIMs is low. In the case of LIM1, the average R^2 of the estimated equation is 28% when the model is estimated by country and 34% when it is estimated by industry. Interestingly, the explanatory power of this equation increases in LIM2 (i.e., when we include accruals as an independent variable). This suggests that accruals provide valuable information about future realizations of earnings. Findings for LIM1 (panel B of Table 4) are that when the model is estimated by country the lagged-earnings coefficient in the information dynamics equation is significantly positive for three out of four countries and when it is estimated by industry it is significantly positive in all but one sector. Results for LIM2, which provides for separate persistence parameters for earnings and total accruals, show that in the case of the earnings information dynamics equation, the coefficient on lagged earnings (panel B of Table 5) is significantly positive for all countries as well as for all industrial sectors for which the model is estimated.

Finally, in the case of the accruals information dynamics equation (panel B of Table 5) the coefficient on the lagged value of accruals is significantly positive in all countries and all industries.

3.5. *Forecasting market values*

The second of the two main research questions addressed in this paper is whether partitioning the sample of firms by country or by industry leads to lower errors in predicting equity market values.

Table 6 presents descriptive statistics (mean, median, minimum, maximum, and standard deviation) for the absolute percentage error for equity market value predictions obtained from estimations in model parameters using the jack-knifing procedure described earlier. Results presented in Table 6 refer to the prediction error from pooled and separate industry and country estimations. Comparisons are based on aggregating all errors from separate country and industry estimations. It is noteworthy that the median forecasting error as a percentage of actual market value is in excess of 150% for most contexts (country, sector) and models (LIM1, LIM2) studied, although this is partly caused by our estimation procedure which keeps parameters constant across years.³ This indicates that market values reflect more information than simply earnings and book value of equity and/or interpret them in a more complex way than the simple models used here.⁴

Consistent with previous results, that the relation between equity market value and accounting variables differs across countries and industries, we observe that the median and the mean absolute percentage error (APE) is smaller when estimating both LIMs

³ This is necessary because our forecasting tests are based on out-of-sample data and therefore parameters for each year are, by definition, unobservable.

⁴ Our regression models do not take into account that market value of equity is always a positive number. If our predictions were computed as the maximum of zero and the value predicted by the model, predictions errors decrease substantially but our results do not change.

Table 6

Distribution statistics of absolute percentage error of out of sample market value forecasts

		Minimum (%)	Median (%)	Mean (%)	Maximum (%)	S.D. (%)
LIM1	Forecast using year, country and industry dummies	0.1	194.6	833.3	32,303.4	2029.4
	Forecast by country using year and industry dummies	0.1	176.6	794.4	27,201.1	1889.4
	Forecast by industry using year and country dummies	0.1	149.5	687.8	45,204.7	1770.2
LIM2	Forecast using year, country and industry dummies	0.1	187.8	827.0	31,353.9	2029.1
	Forecast by country using year and industry dummies	0.1	165.2	786.8	28,492.2	1900.6
	Forecast by industry using year and country dummies	0.1	147.6	692.4	51,835.6	1820.0

by country or by industry rather than using the pooled model which includes industry and country fixed-effects. Furthermore, for both LIMs we observe that the median and the mean APE is smaller when estimating the models by industry rather than by country.

To test whether differences in the forecasting errors are statistically significant when each LIM is estimated by industry and by country in the pooled sample, we used the Wilcoxon signed-rank test. Test results reject both HA5 and HA6 and thus confirm that both LIMs lead to superior forecasts of the market value of equity after adjusting for industry effects rather than after adjusting for country effects, which suggests that there is greater homogeneity of firms within the industry classifications than in the country ones. This result further supports our contention that cross-sectional differences in the valuation multiples of earnings and book value are not simply caused by differences in national accounting rules.

When estimating both LIMs in country-specific contexts, the United Kingdom is the country with the smallest median forecasting error, followed by the Netherlands, Germany and France. The United Kingdom is also the country with the mean average APE followed by Germany, Netherlands, and France. Previous studies suggest that the European country where financial statements are most investor-oriented is the United Kingdom (Arce & Mora, 2002; King & Langli, 1998) and Germany the country where they are least investor-oriented (Arce & Mora, 2002). The above mentioned rankings contrast, at least partly, with previous studies which found that German financial statements are the least value-relevant and they also differ from those based on R^2 .

When predicting market values by industry, the sector with the biggest median APE for both LIMs was information technology, while the sector with the smallest median error was industrials. Intuitively, this ranking reflects sectors which closely fit the traditional accruals accounting model (mature sectors) and those where market prices reflect growth expectations rather than past profitability.

Comparison of mean APE based on LIM1 and LIM2 in Table 6 reveals that disaggregation of earnings into cash flow and total accruals aids in predicting equity market values when the models are estimated by country but not when estimating the pooled models or the models by industry. This result is partly confirmed if we also look at the median APE, although the median APE based on the pooled LIM1 is also smaller than the median model based on the pooled LIM2. Thus, comparison of APE across LIMs supports disaggregation of earnings

Table 7

Summary results for LIM1 (sub-sample of positive income firm-year)

Panel A: Summary statistics from regressions of market value of equity on earnings and book value of equity:

$$MV_{it} = \alpha_1 + \alpha_2 NI_{it}^z + \alpha_3 BOOK_{it} + \varepsilon_{3it}$$

	α_1		α_2		R^2
	Coefficient	z-statistics	Coefficient	z-statistics	
Pooled fixed effects	17.557	7.33*	2.319	21.60	0.68
Across countries					
Mean	15.189		2.494		0.71
S.D.	6.717		0.382		
Maximum	22.023		3.021		
Minimum	5.931		2.123		
No. significantly positive	3		4		
No. significantly negative	0		0		
Across industries					
Mean	17.062		2.917		0.72
S.D.	6.948		1.177		
Maximum	31.817		4.927		
Minimum	10.330		1.823		
No. significantly positive	6		7		
No. significantly negative	0		0		

Panel B: Summary statistics from regressions of earnings on lagged earnings and book value of equity:

$$NI_{it}^z = \omega_{10} + \omega_{11} NI_{it-1}^z + \varepsilon_{1it} \text{ and book value of equity on lagged book value of equity: } BOOK_{it} = \omega_{20} + \omega_{22}$$

$$BOOK_{it-1} + \varepsilon_{2it}$$

	ω_{11}		ω_{12}		R^2	ω_{22}		R^2
	Coefficient	z-statistics	Coefficient	z-statistics		Coefficient	z-statistics	
Pooled fixed effects	0.256	4.35*	-0.003	-0.69	0.18	1.007	42.93*	0.93
Across countries								
Mean	0.359		-0.006		0.27	1.004		0.92
S.D.	0.273		0.012			0.093		
Maximum	0.754		0.006			1.068		
Minimum	0.126		-0.020			0.867		
No. significantly positive	3		0			4		
No. significantly negative	0		1			0		
Across industries								
Mean	0.313		-0.004		0.27	1.017		0.92
S.D.	0.210		0.019			0.077		
Maximum	0.753		0.028			1.160		
Minimum	0.128		-0.030			0.900		
No. significantly positive	6		1			7		
No. significantly negative	0		1			0		

* Significant at the 1% level.

Table 8
Summary results for TIM2 (sub-sample of positive income firm-year)

Panel A: Summary statistics from regressions of market value of equity on earnings, accruals book and value of equity $MV_{it} = \alpha_0 + \alpha_1 NI_{it} + \alpha_2 AC_{it} + \alpha_3 BOK_{it} + \alpha_4 BV_{it}$									
	α_1			α_2			α_3		
	Coefficient	t-statistics	z-statistics	Coefficient	t-statistics	z-statistics	Coefficient	t-statistics	z-statistics
Pooled fixed effects	15.104		7.87*	-0.604		-1.06	2.195		14.73*
Across countries									
Mean	13.891			1.783			2.137		
S.D.	4.138			2.646			0.493		
Maximum	18.193			1.684			2.655		
Minimum	8.243			4.649			1.860		
No significantly positive	4			0			4		
No significantly negative	0			2			0		
Across industries									
Mean	16.477			2.868			2.626		
S.D.	5.389			2.644			1.327		
Maximum	24.867			0.135			4.541		
Minimum	10.075			6.876			0.054		
No significantly positive	6			0			6		
No significantly negative	0			0			0		
R^2									
Pooled fixed effects									0.69
Across countries									0.74
Mean									
S.D.									
Maximum									
Minimum									
No significantly positive									
No significantly negative									
Across industries									0.75
Mean									
S.D.									
Maximum									
Minimum									
No significantly positive									
No significantly negative									

Panel B: Summary statistics from regressions of earnings on lagged earnings and book value of equity $NI_{it} = \alpha_{00} + \alpha_{10} NI_{it-1} + \alpha_{20} AC_{it-1} + \alpha_{30} BOK_{it-1} + \alpha_{40} BV_{it-1}$									
	α_{10}			α_{20}			α_{30}		
	Coefficient	t-statistics	z-statistics	Coefficient	t-statistics	z-statistics	Coefficient	t-statistics	z-statistics
Pooled fixed effects	0.389		8.77*	0.123		6.2*	0.026		0.37
Across countries									
Mean	0.442			0.172			0.034		
S.D.	0.193			0.097			0.020		
Maximum	0.709			0.082			0.009		
Minimum	0.255			0.268			0.057		
No significantly positive	4			0			0		
No significantly negative	0			4			3		
Across industries									
Mean	0.434			0.162			0.027		
S.D.	0.249			0.074			0.017		
Maximum	0.958			0.104			0.006		
Minimum	0.214			0.230			0.042		
No significantly positive	7			0			0		
No significantly negative	0			6			5		
R^2									
Pooled fixed effects									0.93
Across countries									0.92
Mean									
S.D.									
Maximum									
Minimum									
No significantly positive									
No significantly negative									
Across industries									0.92
Mean									
S.D.									
Maximum									
Minimum									
No significantly positive									
No significantly negative									

* Significant at the 1% level

Table 9

Distribution statistics of absolute percentage error of out of sample market value forecasts

		Minimum (%)	Median (%)	Mean (%)	Maximum (%)	S.D. (%)
LIM1	Forecast using year, country and industry dummies	0.1	142.6	584.4	37,057.2	1540.2
	Forecast by country using year and industry dummies	0.1	138.1	643.0	34,420.2	1824.5
	Forecast by industry using year and country dummies	0.1	103.6	449.9	23,173.8	1259.8
LIM2	Forecast using year, country and industry dummies	0.1	136.6	571.7	37,773.2	1521.4
	Forecast by country using year and industry dummies	0.1	119.4	599.3	33,797.0	1783.8
	Forecast by industry using year and country dummies	0.1	106.1	480.8	27,296.0	1379.0

into accruals and cash flows for by-country estimation but not in the case of by industry estimation.

3.6. Positive earnings results

Previous research (inter alia, Barth, Beaver, & Landsman, 1998) has documented a positive relation between earnings persistence and value relevance. Losses are less persistent than profits (Collins et al., 1997; Hayn, 1995) and therefore valuation parameters are likely to differ for firms with positive and negative income. The results presented in Tables 4 and 5 are based on a sample of firms that includes both profit- and loss-making firms.

Thus, we re-estimated both LIM1 and LIM2 limiting the sample to positive accounting income firm-years. Estimated coefficients are presented in Tables 7 and 8 while in Table 9 we present results on the forecasting performance of the models.

While the profitable firm-years sub-sample consists of 4415 observations, or about 74% of the full sample, results in Tables 7 and 8 are consistent with those for the full sample. In contrast to expectations, the estimated parameter for the persistence of abnormal earnings is not substantially different for the positive earnings sub-sample versus the full one in the case of LIM1 and actually smaller in the case of LIM2. This is compensated, however, by the substantially higher persistence of accruals.

Turning to the valuation equations, signs and significance of α_2 in LIM1 and α_2 and α_3 in LIM2 are generally the same as those estimated using the full sample.

Finally, the forecasting performance of our models reported in Table 9 is substantially better if the jack-knifing procedure outlined earlier is applied only to profitable firm-years. On average, the median forecasting error is at least 25% smaller. However, results about the relative performance of country-based versus industry-based estimation and cross-LIM comparisons are not affected by the partitioning of the sample.

Overall, results presented in Tables 7–9 suggest that inferences based on the full sample are robust to the inclusion of loss-making firms in the sample.

4. Conclusions

This study extends previous work on cross-national differences in the valuation of earnings and book value of equity. Using a sample of companies from four European countries, we jointly estimate Ohlson's valuation equation with linear information dynamics equations and we evaluate the influence of industry sectors in the forecasting performance of the model. We estimate two linear information valuation models (LIM) employing two levels of earnings disaggregation. The first LIM is based on aggregate residual earnings while the second includes total accruals as a separate variable. We initially estimated pooled versions of both LIMs and found earnings and book value of equity to be significant explanatory variables of the cross-sectional variation in market values while accruals in the second is not.

Our first set of testable hypotheses was about cross-sectional variation in the valuation multiples of earnings and book value of equity in the two LIMs and accruals in LIM2 when these are estimated by country and by industry. Our findings were that earnings and book value are significant and with the expected sign in almost all country and industry contexts in both LIMs. Earnings valuation multiples differ significantly across both countries and industries while the valuation multiples on book value of equity vary significantly only when the models are estimated by industry. Accruals which is used as a separate variable in LIM2 is a significant variable only in a limited number of country and industry contexts but, nevertheless, there are statistically significant differences in the valuation multiples across both countries and industries.

To test whether basing predictions on separate country and industry estimations of valuation model parameters affects equity market value predictions, we compare prediction errors from pooled and separate country and industry estimations for each LIM. Our results indicate that when estimating each LIM separately by industry, prediction errors are substantially smaller than when estimating a pooled model or when estimating the models by country.

Finally, our results support disaggregation of earnings into accruals and cash flows if the LIM equity valuation models are estimated by country but not in the case of sector-specific estimation and prediction. In the latter case, prediction errors are larger on average than if we did not include accruals.

Overall, our results indicate that there is convergence in financial-reporting practices within sectors. The size of the errors, however, suggests the need for consistency, which implies that there is a need for more sector-specific standards.

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Appendix A. Financial-reporting regulations of sampled countries

	France	Germany	Netherlands	United Kingdom
<i>Individual accounts</i>				
Orientation	Tax-oriented	Company and tax law	Economics/universities	True and fair view
Tangible assets	Historic cost	Historic cost	Historic cost	Historic cost
		Tax rates	Current values	Current values
Fixed assets depreciation	Tax rates	Lower of cost or market (FIFO, WAC)	Lower of cost or market (FIFO, LIFO, WAC)	Lower of cost or market (FIFO, WAC methods)
Inventory	Lower of cost or market (FIFO, WAC)		Current value accounting is allowed	
R&D expenses	Expensed as incurred	Expensed as incurred	Capitalized if recoverable	Expensed as incurred
Leased assets	Not capitalized	Not capitalized	As in UK and USA	Financial leases are capitalized
Pension and retirement benefits	Expensed as incurred. Future commitments are not recognized as liabilities	Pension obligations are accrued	As in UK and USA	Pension costs are recognized systematically, and rationally over the period, during which the employee's services are performed
Deferred taxation	Not accounted for	Not accounted for	Liability method (full provision)	Liability method (full provision)
Provisions for expenses and losses	Accounted for on an accrual basis	Heavy use		Accounted for on an actual basis

<i>Consolidated accounts</i> Orientation	Fair view, Substance over form			
IFRS U.S. GAAP Leased assets Deferred taxation	Capitalized Accounted for	Allowed for listed companies Accounted for using the liability method	Charged against income Charged against reserves Capitalized and subsequently amortized	Capitalized and amortized
Business combinations Goodwill	Purchase method Capitalized and amortized	Offset against reserves or capitalized and amortized	Purchase method Pooling of interests (in limited circumstances) Proportional consolidation or equity method for joint ventures	Purchase method Pooling of Interests (in limited circumstances) Proportional consolidation for unincorporated joint ventures
Consolidation method	Purchase method Proportional consolidation for joint ventures Equity method for investments in non-consolidated entities over which significant influence is exercised	Purchase method Pooling of Interests (in limited circumstances) Proportional consolidation or the equity method for joint ventures	Equity method for investments in non-consolidated entities over which significant influence is exercised	Equity method for investments in non-consolidated entities over which significant influence is exercised
Foreign currency translation	Temporal method Closing rate method	No specific requirements	Temporal method Closing rate method	Temporal method Closing rate method

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Discussion

Commentary on differences in the valuation of earnings and book value: Regulation effects or industry effects?

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This study contributes to the growing literature on cross-country differences in the value relevance of earnings and book value, focusing on the United Kingdom, France, Germany, and the Netherlands.

The paper highlights four issues:

1. The potential improvements in value relevance obtained by partitioning earnings into its cash and accruals components.
2. The potential improvements in the explanatory value obtained by partitioning the sample according to industry.
3. The potential improvements in the explanatory value obtained by partitioning the sample according to country.
4. How the out-of-sample forecasting performance of the model varies according to the partitions outlined above.

The authors find that the cash accrual partition is only significant in the Netherlands and the United Kingdom. This result extends to the out-of-sample forecasting performance of the models when one allows the parameters of the model to vary by country. However it makes no difference in the pooled model, or when parameters vary by industry but not country. The authors do not present results that allow for both industry and country variation.

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In general the authors find, both in-sample and out-of-sample, that the model improvements achieved by allowing industry variation in the parameter values is greater than that achieved by allowing cross-country variation. This suggests that fundamental industry effects are more important than the cross-country differences that, the authors argue, are mainly due to differences in accounting rules and practices.

I believe the results of the authors are interesting, and worthy of further development. However, I also do have one major policy concern about the paper, and a number of suggestions for further development of the work.

1. The ir/relevance of value relevance

The paper adopts a value relevance perspective. However, financial reporting also serves a contracting and stewardship role that is arguably more important than value relevance.

I doubt if the unfortunate external shareholders of Parmalat and Enron would thank you for knowing that the association with share price and earnings was high. This is a major problem for any attempt to draw policy conclusions from linear information models. Such models take the cash flows as exogenously given. In the LID context, accounting serves no economic role. The accounting numbers simply reflect information that is already known to all economic agents. Accounting numbers do not affect investor or managerial behaviour in such models.

In order to draw policy conclusions we need to be able to model accounting in a context where managerial and investor behaviour and cash flows are “caused” by accounting; i.e., we need to be able to model how behaviour changes when accounting changes. LID models are irrelevant for this task.

Consider, for example, what we would conclude if we found that the LID estimates were identical across all countries and all industries. Would this imply that accounting was perfect? Clearly not; for if accounting was universally poor across all EU states, then the LID models could still yield identical fitted values.

In thinking about policy relevance we should really be thinking about the regulation of the financial-communication and corporate-governance system as a whole. The formal accounting numbers are just a cog in a much bigger machine. In designing a car it is important to have a good gear box, but one would not design an entire car around the gear box. So long as there are major differences in disclosure, other market regulations, and legal/governance regimes, it is far from obvious why one would want to pursue equality of the value relevance of accounting numbers as a desirable policy objective.

2. Suggestions for further work

The model adopted in the paper assumes unbiased accounting. There are better models around that allow for *ex ante* conservative accounting.

The model does not allow for Basu-type earnings conservatism. Basu-type models are inherently non-linear and do not mix well with LID models. Given the now massive

empirical support for the existence of Basu conservatism this is a major weakness of the LID approach to value relevance.

The paper makes no attempt to control for disclosure differences. More general versions of the LID model allow for other information, and this might be a way to capture differences in disclosure. For example one might use analysts' forecasts to back out estimates of other information, to the extent that such forecasts reflect other disclosures.

The model makes no attempt to distinguish between normal and discretionary accruals. The results could change if total accruals were further partitioned in this way. I suspect for example, that the null accruals effects for Germany and France might change if this is done.

Discussion

Response to commentary on “Differences in the valuation of earnings and book value: Regulation effects or industry effects?”

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1. Introduction

Our paper uses data for four EU countries (France, Germany, Netherlands and the United Kingdom) to investigate differences in the explanatory power of earnings and book value of equity for the market value of equity obtained when partitioning our sample according to industry and according to country. We find that partitioning by industry generally improves the explanatory power of accounting variables compared to results obtained when partitioning the sample by country which indicates that there is convergence in the financial reporting practices within economic sectors. The size of the errors however, implies that there is a need for more sector specific standards to improve consistency.

Walker (2005) raises a number of legitimate concerns about our paper which can be summarized into three issues. First, that financial reporting also serves a contracting and stewardship role that is arguably more important than value relevance in terms of policy relevance. Second, that the use of linear information dynamics models limits our ability to draw policy implications and finally he suggests possible extensions to our work. The following are our response to the issues raised by the discussant.

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2. The role of accounting information

Walker (2005) suggests that “financial reporting also serves a contracting and stewardship role that is arguably more important than value relevance” and therefore “in thinking about policy relevance we should really be thinking about the regulation of the financial communication and corporate governance system as a whole.” We could not agree more. Consistent with Ball (2001) we believe that the requirements for an economically efficient financial reporting system cover a substantial part of what is usually thought of as the economic, legal and political infrastructure of a country.

However, arguments regarding the harmonization of accounting regulation in the academic literature (for example, Joos & Lang, 1994) are primarily based in differences in the valuation implications of accounting data across regulatory regimes. Furthermore, it is clear that the European Commission had stock market investors in mind when adopting the regulation requiring listed companies in accordance to IAS from 2005 onwards. Last, but certainly not least, our results lend support to the discussant’s comment since they indicate that value relevance differences are not primarily due to jurisdictional differences in regulatory regimes.

3. The use of lineal information dynamics models

A fundamental assumption of the Ohlson-type model used in our study is that cash flows are exogenously defined. An alternative formulation of this criticism is that Ohlson-type models assume a Modiglianni–Miller world where financing decisions do not affect the value of the firm. In such a context, accounting numbers do not affect investor or managerial behaviour and therefore, strictly speaking, the results of our tests cannot be used for policy recommendations. We recognize the validity of this criticism but we must point out that these same models have been used before for this very purpose in a large number of previous studies. These include those cited in our paper for cross-country comparisons of the valuation implications of earnings and book value of equity.

4. Suggestions for further work

The discussant makes three suggestions for possible improvements in our research design and further work. More specifically, he suggests that we should control for disclosure differences in different contexts (countries and/or industries), that we should investigate models that allow for ex ante conservative accounting and Basu-type earnings conservatism and finally that we should distinguish between normal and discretionary accruals. We agree that these suggestions, if we could implement them, would improve our paper. However, there are problems with the dataset we use.

In order to control for disclosure differences, Walker (2005) recommends that we use analysts’ forecasts of earnings. In practice, there is significantly smaller analyst coverage of non-UK firms in standardized databases (such as I/B/E/S), i.e. only a very small number of such forecasts are available, and this would significantly bias our results.

The second issue raised by Walker (2005) refers to a fundamental assumption of the model used in the paper, namely unbiased accounting. One example of model that assumes earnings conservatism is Begley and Feltham (2002) which again requires data that are not as readily available for firms from some countries in our sample as for others.

Finally, evidence in Hribar and Collins (2002) suggests that accruals should be measured directly from the statement of cash-flows as opposed to measuring accruals in successive balance sheet accounts. This would allow a proper partitioning of accruals in normal and discretionary components using a model outlined in their study. Nevertheless, publication of cash-flow data by French and German companies does not cover the full period of our sample. Additionally, both the Hribar–Collins model and our methodology require estimates of lagged values of some variables and therefore separating accruals as suggested by the discussant would lead to a much smaller population of firms. Given our modelling approach (modified jackknife) relies on the availability of data for a substantial number of firms, we are hesitant to draw inferences based on a small sample.

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Corporate mandatory disclosure practices in Bangladesh

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Abstract

This study reports the results of an empirical investigation of the extent of mandatory disclosure by 94 listed companies in Bangladesh. It also reports the results of the association between company-specific characteristics and mandatory disclosure of the sample companies. The results indicate that companies in general have not responded adequately to the mandatory disclosure requirements of the regulatory bodies. It has been found that companies, on average, disclose 44% of the items of information, which leads to the conclusion that prevailing regulations are ineffective monitors of disclosure compliance by companies. Company age appears to be an insignificant factor for mandatory disclosure. And there is little support for industry size as a predictor of mandatory disclosure except where size is measured by sales. Then it is marginally significant. Profitability was also found to have no effect on disclosure. And status, i.e., whether a company is modern or traditional also has no effect on mandatory disclosure.

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Keywords: Bangladesh; Mandatory disclosure; Annual report; Disclosure index; Regulatory framework; Information; Listed companies

1. Introduction

In recent years, the issue of corporate disclosure has received a great deal of attention from many researchers (for example, see Benjamin & Stanga, 1977; Carol & Pownall, 1994; Cooke, 1989; Forker, 1992; Inchausti, 1997; Ingram & Frazier, 1980; Lang & Lundholm, 1993; Singhvi & Desai, 1971; Wallace, 1988). Why corporations should and do disclose information is articulated in various theories, namely, stakeholder theory, agency theory,

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legitimacy theory, and political economy theory (Choi, 1973). While different theoretical perspectives make different arguments, they all agree that companies release information mostly for traditional user groups such as shareholders, creditors, financial analysts, and security consultants who find this information useful when making investment decisions (Cooke, 1989). The agency theory implies that companies increase disclosure in order to mitigate conflicts between shareholders and managers. In addition, companies wishing to enhance their firm value may do so by increased disclosure (Lobo & Zhou, 2001). Corporate disclosure is, however, subject to potential pressures from regulatory bodies.

Disclosure is generally made in company annual reports through the statements or accompanying notes. Although other means of releasing information, such as medial release, interim reporting, letters to shareholders, and employee reports, are used by the companies, the annual report is considered to be the major source of information to various user-groups (Marston & Shrivies, 1991). Nevertheless, all parts of the annual reports are not equally important to all users. The income statement is believed to be the section most preferred by investors, whereas cash flow statement and balance sheet are the most useful sections to bankers and creditors (Eccles & Mavrinac, 1995; Ho & Wong, 2001). Likewise, users of accounting information weight audit reports, directors' reports, accounting policies, and historical summary differently. The annual report should contain information that will allow its users to make correct decisions and efficient use of scarce resources.

Much prior research has focused on corporate transparency and capital market development. Since the fall of Enron in the United States, there has been a wider recognition of the importance of corporate transparency and disclosure. The effective functioning of capital markets, however, significantly depends on the effective flow of information between the company and its stakeholders. Information disclosure is seen as a means to improve marketability of shares, to enhance corporate image, and to reduce the cost of capital (Meek, Roberts, & Gray, 1995). Companies provide information on the ground that such disclosure will not respond to the negative impact on the company image (Choi, 1973). It is seen that a company discloses information in line with legislative frameworks (Alam, 1989; Karim et al., 1998). Brownlee et al. (1990) argue that regulatory agencies should be more concerned with the full and fair disclosure of information than with the specific accounting methods used to measure or report economic transactions. The Companies Act 1994 provides the basic requirements for disclosure and reporting applicable to all companies incorporated in Bangladesh (Government of Bangladesh, 1993). The Act requires companies to prepare financial statements in order to reflect a true and fair view of the state of affairs of the company. The Securities and Exchange Commission (SEC), another regulatory body, requires all listed companies to comply with accounting standards promulgated by the Institute of Chartered Accountants of Bangladesh (ICAB), in addition to its own disclosure provisions (Government of Bangladesh, 1993). Disclosure provisions of the Security Exchange Rules are, in fact, restricted only to companies listed on the stock exchanges. It is often alleged, however, that company annual reports do not comply with the disclosure requirements stipulated by the regulatory agencies, resulting in poor disclosure compliance by the listed company (Ahmed & Nicholls, 1994; Hossain, 2000; Karim, 1996).

Considerable research (e.g., Benjamin & Stanga, 1977; Cooke, 1989; Inchausti, 1997; Lang & Lundholm, 1993; Meek et al., 1995; Singhvi & Desai, 1971; Wallace, Naser, &

Mora, 1994) has been undertaken in the recent past to enhance our understanding of the factors influencing disclosure practices in Western society. Little is known about this phenomenon in developing countries, particularly in Bangladesh. Moreover, prior research focuses mostly on voluntary disclosures. There is little empirical evidence that looks explicitly at mandatory disclosures, especially since the 1994 Companies Act. Again, Hossain and Taylor (1998) used company reports that were prepared before the enactment of the Companies Act 1994. On the other hand, Hossain (2000) specifically investigated the compliance of International Accounting Standards (IASs) adopted in Bangladesh. He found that compliance with the disclosure practices mandated by the three regulatory bodies (Companies Act 1994, disclosure requirements of the stock exchange, and the approved IASs) in Bangladesh is rare.

This paper investigates the disclosure practices of listed companies in Bangladesh to see how they comply with mandatory rules established by the three regulatory bodies. In addition, it examines the association between company characteristics and the extent of disclosure. The findings of the study would be of immense interest to listed companies, investors, and those involved in standard setting processes.

The remainder of the paper is organized as follows. Section 2 discusses the regulatory framework for disclosure in Bangladesh. Section 3 presents a review of the literature and develops the study's hypotheses. The research method is outlined in Section 4. Section 5 presents the results. Finally, Section 6 presents the conclusions, possible policy implications of the results, potential limitations and directions for future research.

2. The legal framework for disclosure

Corporate reports generally include information in conformity with reporting and disclosure laws, because laws require them to provide minimum amount of information to facilitate evaluation of the securities. Every country, in general, has its own regulatory framework that governs disclosure in corporate reports within that country. In Bangladesh, corporate disclosure is governed by a number of statutes. For example, companies limited by liabilities are guided by the Companies Act 1994. The extent and nature of disclosures of the listed companies are influenced by Securities and Exchange (SEC) Rules 1987 (Government of Bangladesh, 1987), the IASs adopted by the Institute of Chartered Accountants of Bangladesh (ICAB) and the disclosure provision of the Companies Act 1994 (Government of Bangladesh, 1994). These three regulatory bodies provide the framework for corporate disclosures in Bangladesh. There is, however, no one set of generally accepted standards based on these three sources. Again, industries like railways, electricity, insurance, and banks have their own distinct regulations that govern disclosures in their annual reports. Disclosures are also influenced by Nationalized Order, 1972, Banking Companies Act (Government of Bangladesh, 1991), and Income Tax Ordinance 1984 (Government of Bangladesh, 1984). Like other countries of this region, Bangladesh adopted the Companies Act 1913 of the then British India. This Act was in force in Bangladesh before the promulgation of the Companies Act of 1994, which is largely influenced by the British Companies Act. The Companies Act 1913 required limited public companies to submit an annual balance sheet containing

a summary of their capital, liabilities, and assets. But no specific formats were prescribed. Profit and loss accounts were prepared without mentioning the nature of activities in detail. These two statements needed to be audited and presented at the annual general meeting for approval prior to publication. The fundamental weakness of the regulation is that it does not provide any guidelines regarding the contents or how the value of the respective items has been arrived at. The Companies Act 1994 made major alternations to the financial reporting practices and disclosures of limited liability companies (Ahmed & Kabir, 1995). Under the new law both statements also have to be audited and reported before the annual general meeting. The statements can be prepared either horizontally or vertically. The law requires that fixed assets are to be shown at cost or valuation. The provisions for depreciation are the annual charge to be disclosed separately. The required disclosures are classified and specified in far more detail and include reserves and the changes that occurred during the year, director's remuneration, commission, tax provision, and the flow of foreign currency. Section 185 of the Companies Act provided mandatory items to be disclosed on the balance sheet and income statement and Section 186 provides a list of information items that must be disclosed in the director's report (Government of Bangladesh, 1994). Legislative requirements prior to 1994, however, failed to indicate the actual level of corporate disclosure. No particular formats were prescribed and even the necessary contents of the accounting reports were not specified. In contrast, the Companies Act 1994 included many provisions, which are mandatory and, some of those are also required by the approved IASs (Hossain & Taylor, 1998).

The accounting profession in Bangladesh is guided by two professional institutes, namely, the Institute of Chartered Accountants of Bangladesh (ICAB) and the Institute of Cost and Management Accountants of Bangladesh (ICMAB). The financial audit is done by members of ICAB and the cost audit by members of ICMAB. However, both are under the control of the Ministry of Commerce Bangladesh. The two institutes are run and managed by council members, who are elected internally, and representatives from the government. The council is responsible for the development of the accounting profession in Bangladesh. Moreover, the ICAB has been given the sole authority to develop and issue accounting and reporting standards and to monitor their application throughout the country.

Stock exchange authority governs disclosure in company reports as a part of listing requirements. At the time of independence in 1971, Bangladesh inherited only one stock exchange, the Dhaka Stock Exchange (DSE). It was formed in 1954 and registered as a limited liability company. The Chittagong Stock Exchange (CSE), another stock exchange of the country, was set up in 1999 and functions in Chittagong. Both stock exchanges are regulated under the Securities and Exchange Rules 1987 and the Companies Act. Stock exchange companies must disclose the following information in compliance with SEC regulations: company history, outline of business, profile of top employees, profile of directors, information on capital, changes in share capital, number and types of shareholders, audited financial statements, consolidated statements, post-balance-sheet events, holdings in associate and subsidiary companies with relative percentage and payment of dividends. The stock exchange thus places a continuing disclosure and reporting obligation on listed companies. Security exchange authority has, therefore, a

positive role in determining the level of disclosure in company reports (Wallace & Naser, 1995).

It is recognized that IASs issued by the International Accounting Standards Committee (IASC, 2001) have made important contributions toward harmonization in accounting and reporting practices in individual countries. The IASC has, however, no authority to enforce the accounting practices of its member countries. The implementation of accounting standards is left to the local accountancy bodies. In countries where professional accounting institutions are not strong, the implementation of accounting standards will not be effective. The professional bodies may persuade the government to amend the law so that the standards issued by the IASC can be adopted. It should be noted that IASC was reconstituted (April 01, 2001) and is now known as the International Accounting Standards Board (IASB). The Institute of Chartered Accountants of Bangladesh as a member of this body (IASB) is entrusted with the task of adoption and enforcement of standards in Bangladesh. The Technical and Research Committee of the ICAB selects, reviews, and modifies the standards, where necessary, to conform to local requirements. Members of the ICAB comply with the adopted accounting standards and disclosure provisions of the Companies Act, as well as the disclosure requirements of the stock exchanges. Like the IASC, the ICAB are, however, recommendatory in nature, as the ICAB has no legislative power to enforce compliance with the disclosure requirements of the accounting standards they issue (Hossain, 2000). Since members of the ICAB are kept constantly aware of the development of accounting and auditing standards, they therefore contribute to the improvement of financial reporting in Bangladesh. Once accounting standards adopted by the ICAB gain mandatory status through the SEC's directives they become applicable to all listed companies. Specifically, all listed companies are to abide by accounting standards adopted by the ICAB and hence, accounting standards are mandatory only for the companies listed on the stock exchange.

The SEC in Bangladesh plays a central role in monitoring and enforcing mandatory disclosure compliance of listed companies. Listed companies are required to prepare financial statements in accordance with the approved IASs along with the disclosure provisions of the Companies Act and the stock exchanges. The SEC also prescribes penal provisions for non-compliance. These include: barring the auditor who conducted the non-complying audit from acting as an auditor for a listed company for a period of up to five years; fining the auditor and the company officer up to one thousand taka for non-compliance with stipulated provisions under the Companies Act. Like the U.S. Securities and Exchange Commission (SEC), the SEC in Bangladesh uses a review process to monitor and enforce compliance with mandatory disclosure requirements. The primary objectives of monitoring company annual reports are to examine whether they adhere to regulatory frameworks and to encourage compliance. In contrast to the U.S. SEC that uses a hard approach, the SEC in Bangladesh employs a lenient approach to enforce compliance. The weak enforcement approach of the SEC may lead to the withholding of mandatory disclosure information. To enforce existing rules, the SEC Bangladesh has the power to suspend companies or remove their listing privileges if they do not comply with the listing requirements. The power to reward the reporting entity is also embedded in the enforcement process. Since the SEC Bangladesh hardly ever imposes sanctions for non-compliance of mandatory disclosures, better enforcement procedures appear warranted.

3. Literature review and hypothesis development

The demand for published financial information of companies has increased worldwide as users of the information become more aware. But often disclosure does not serve the need of the users because managers are likely to consider their own interests when exercising managerial discretion. In fact, this might enhance the disclosure gap—the difference between expected and actual disclosures, also known as the principal–agent problems. In other words, improved disclosure reduces the gap between management and the outside world, enhances the value of stock in the capital market, increases liquidity, reduces cost, and so on (Cooke, 1989; Hossain, 2000; Karim, 1996). One striking feature in corporate reporting is that a company generally provides information to discharge specific obligations: to society, investor, supplier, creditors, and legal authorities. However, the decision to provide or not provide certain information is likely to be influenced by a variety of factors. Prior research has examined factors like size, profitability, and listing status to find out their links with disclosure. Cooke (1989), for example, examines three categories of companies, namely, unlisted, listed, and multiple listed, and suggests that disclosure is lower for unlisted companies than listed companies, and that disclosure by listed companies is lower than that of multiple listed companies. Lang and Lundholm (1993) suggest that disclosures are higher for larger firms. Lobo and Zhou (2001) demonstrate that companies that are performing well are likely to provide more information than poorly performing companies. Also, cultural value is no less important a determinant of disclosure. For example, in countries, which support a culture that has a high sense of secrecy, management is less likely to pursue a high level of disclosure (Gray & Vint, 1995). Earlier research has examined various company attributes and their association to the levels of disclosure. The present study focuses on the level of disclosure in relation to the age, size, status, and profitability of the companies. Additionally, prior studies (Owusu-Ansah, 1998; Wallace & Naser, 1995) define mandatory disclosure as the presentation of a minimum amount of information required by laws, stock exchanges, and the accounting standards setting body to facilitate evaluation of securities. Similarly, the present study concentrates on mandatory disclosure for items of information required by the Companies Act 1994, the listing rules of the stock exchanges, and the approved IASs that listed companies in Bangladesh to disclose those in their annual reports.

3.1. Size

Prior studies have identified size as significantly associated with the level of disclosure (Cooke, 1989; Hossain, 2000; Lang & Lundholm, 1993; Owusu-Ansah, 1998). The size variables considered in these studies include sales, total assets, number of employees, and number of shareholdings. In the present study, the size of the company was determined by taking into account the capital employed and the annual sales of the company. Capital employed is the total of net worth and long term loans. Alternatively, it is defined as total of fixed assets (net of depreciation) and net working capital, or total net assets less current liabilities. Sales as a proxy for size, is equal to net annual sales.

Consistent with prior research, it is hypothesized that there is a significant association between company size and the extent of disclosure. Larger companies may tend to disclose

more information than smaller companies in their annual reports due to their competitive cost advantage (Lang & Lundholm, 1993; Lobo & Zhou, 2001).

3.2. *Age*

For this study, I conjecture that company age is a critical factor in determining the level of corporate disclosure. Older companies with more experience are likely to include more information in their annual reports in order to enhance their reputation and image in the market. Thus, I infer a positive association between the age of the company and the level of disclosure. That is, old companies disclose information to a greater extent than that of new companies. Companies are classified into three categories for this variable: companies registered prior to 1 January 1972 are grouped as “very old” companies; companies registered after 1 January 1972 but before 1 January 1986 are “old” companies; and companies registered after 31 December 1985 are “new” companies.

3.3. *Industry type*

Association between the level of disclosure and industry types provides mixed evidence. Cooke’s (1989) findings report that manufacturing companies disclose more information than other types of companies. But the findings of Inchausti (1997) and Owusu-Ansah (1998) provide no evidence of this association. I use industry type as an explanatory variable in this study, because disclosures differ from one industry type to another. For this study, companies have also been divided broadly into two categories: traditional and modern. Traditional companies are food, textile, jute, synthetic, paper, cement, and sugar. Bangladesh has a long history in these industrial activities which use old technologies for the most part. Financial institutions tend to place the companies in the traditional. Modern companies, which tend to place use new technologies include engineering, pharmaceuticals, chemicals, and metal alloys. The hypotheses drawn for this variable would be: A particular type of company discloses different amount of information than that of other types of company.

3.4. *Profitability*

Previous research (Hossain, 2000; Inchausti, 1997; Karim, 1996; Owusu-Ansah, 1998; Wallace & Naser, 1995; Wallace et al., 1994) use profitability as a determinant of disclosure in corporate annual reports. However, empirical results from the research are mixed. Findings of Wallace et al. (1994), Karim (1996), Owusu-Ansah (1998), and Hossain (2000) suggest that companies having higher profitability disclose more information than those with lower profitability. Also, the relationship between these two variables is found to be positive in a study by Wallace and Naser (1995). Additionally, researchers have used net profit to sales, earnings growth, dividend growth, return on assets, and return on equity as proxies for profitability. In the present study, the rate of return on capital employed and sales have been used as a measure of profitability. It is hypothesized that companies with a higher rate of return (either on

capital employed or sales) disclose information to a greater extent than companies with a lower rate of return on capital employed. Thus, the hypothesis developed for the study is as follows:

H1. There is a significant positive association between a number of company characteristics in respect of size, age, industry type, profitability and the extent of mandatory disclosure.

4. Method

4.1. Selection of sample

This study covers companies listed both on the Dhaka Stock Exchange (DSE) and the Chittagong Stock Exchange (CSE). The total number of companies listed on either stock exchange at the end of 1999 was 212. These companies fall into 11 categories: banks, engineering, food and allied products, pharmaceuticals and chemicals, paper and printing, fuel, jute, service and real estates, insurance, and miscellaneous. As the study is limited to only non-financial manufacturing companies, the companies under the categories of banks, insurance, service and real estates were excluded. The number of companies was thus reduced to 174. The addresses of these companies were collected from the DSE and letters were prepared and sent to the 174 companies requesting them to send a copy of their annual report published in the year 1999. Responses from the company offices were very poor. Only seven annual reports were available by post. I then decided to visit the company head offices in order to obtain reports. This yielded another 87 annual reports of non-financial companies. These 94 (7+87) companies whose annual reports were collected, constitute the sample of the study. Hence, the actual sample represents about 54% of population of non-financial companies listed on the stock exchanges.

The comparative distribution of the companies in the population and the sample are given in Table 1.

Table 1
Distribution of sample by industry type

Industry type	Population		Sample	
	Number	%	Number	%
Engineering	22	12.6	19	20.2
Food and allied product	33	19.0	16	17.0
Fuel and power	4	2.3	2	2.1
Jute	7	4.0	0	0.0
Textile	42	24.1	24	25.5
Pharmaceutical and chemicals	25	14.4	16	17.0
Paper and printing	8	4.6	1	1.1
Cement	5	2.9	4	4.3
Miscellaneous	28	16.1	12	12.8
	174	100.0	94	100.0

4.2. Construction of the disclosure index

Although there are several ways of communicating company information, such as interim reporting, press releases, letters, etc., the annual report is still considered the major medium disclosing information. It has been argued that the information contained in the report usually differs from company to company. Selection of proper items of information that are expected to be disclosed in the annual report is not an easy task. I consulted the mandatory disclosure checklist used in prior studies while preparing the disclosure index for this study. However, the disclosure index employed in this study is based mainly on the three regulatory sources in Bangladesh. They are, as previously stated, the Companies Act 1994, disclosure requirements of the stock exchanges, and the approved IASs. As each source is separate, I included most of the requirements of each source in the disclosure index. The disclosure index was finalized after consultation with the relevant experts. Appendix 1 presents the disclosure index.

Table 2 shows the distribution of 160 items of information across the annual report: balance sheet items 41%, income statement 28%, accounting policies 14%, historical summary 12%, and directors' report 5%.

4.3. Scoring the disclosure items

There are two methods for determining the level of corporate disclosure: weighted and unweighted approaches (Cooke, 1989). The weighted approach allows distinctions to be made for the relative importance of information items to the users (Inchausti, 1997). The advocates of this approach are of the opinion that all items of information are not equally important and, therefore, allocation of weights is done somewhat arbitrarily by the researchers. Another approach and the one adopted for present study is the unweighted approach. This approach is based on the assumption that each item of disclosure is equally important. Additionally, all disclosure items are equally important to the average users (Wallace, 1988). Specifically, attention is given to all users of annual reports rather than particular user groups. Here items of information are numerically scored on a dichotomous basis. Score one is assigned if a company discloses an item of information. In the case of non-disclosure the score is zero. An unweighted index is defined as the ratio of the number of items a company actually

Table 2
Distribution of index items

	No. of Items	%
Balance sheet items	66	41
Income statement items	44	28
Accounting policies items	23	14
Directors' report items	08	05
Historical summary items	19	12
	160	100

discloses to the total that it could disclose. The total disclosure (TD) score thus arrived at for a company is additive as follows:

$$TD = \sum_{i=1}^n d_i$$

Where, d = one if the item d_1 is disclosed; zero, if the item d_1 is not disclosed; n = number of items.

A major issue for the weighted approach is that if different user groups are asked to weight the importance of various items, they may give weight the same items of information differently. The weighted approach has, in fact, encountered several problems. Prior studies, which have examined both weighted and unweighted approaches, draw similar conclusions about the methods (Choi, 1973; Inchausti, 1997). The equal weighting system is, therefore, viewed to be superior to the differential weighting system (Owusu-Ansah, 1998) and for that reason this study uses the unweighted disclosure index approach to measure the level of corporate mandatory disclosures. Similar studies in other countries also have used the unweighted disclosure index approach (Owusu-Ansah, 1998; Wallace & Naser, 1995). But the unweighted approach should be employed with a caveat. One main problem of this approach is that a company may be penalized by assigning a score of zero for the absence of an item of information that is not applicable to it. In order to overcome this problem, the relevance of each absent item needs to be investigated and then classified as non-disclosure for a relevant item of reporting and non-applicable otherwise. For companies having non-applicable items, the use of a relative index is suggested (Owusu-Ansah, 1998). The relative index approach is the ratio of what a particular company actually disclosed to what the company is expected to disclose. In spite of the subjective discrimination between non-disclosure and non-applicable items, this approach is considered to be a more accurate measure than one that assumes that all companies are identical and, therefore, no difference need exist in disclosure requirements. This approach has been employed in several prior studies (see, e.g., Cooke, 1989; Inchausti, 1997; Owusu-Ansah, 1998; Wallace & Naser, 1995; Wallace et al., 1994).

4.4. Test of hypothesis

In order to test the hypothesis I used both non-parametric and parametric statistics. Cooke (1989) used these two approaches in his study. A non-parametric analysis was used for measuring the disclosures of an individual company based on indexes and the level of disclosure practices. This approach used chi-square, and Lambda. Another approach used based on the mean of each category of company, is the contingency coefficient of the correlation. The contingency coefficient of the correlation along with chi-square is considered useful to measure association. When the expected value of one or more cells in the table is less than five, however, chi-square is not a meaningful way to measure association. In that situation, an alternative measure, Lambda, overcomes the limitation of the expected frequencies (Cooke, 1989, p. 201). Lambda varies between zero and one, where zero indicates no association and one

indicates that the variables are perfectly associated. The regression technique used to test H1 is as follows:

$$\text{TDE} = a + B_1\text{Size} + B_2\text{Age} + B_3\text{Profit} + B_4\text{Industry} + \varepsilon$$

Expected sign (+) (+) (+) (+)

Where:

TDE = total disclosure score received from each company

a = the constant, and

ε = the error term

5. Results and discussion

5.1. Level of disclosure and disclosure performance by age

The study reveals that disclosure compliance is poor among listed companies. They disclosed an average of 43.53% of the items selected. The minimum score found in the study is 17.3% and the maximum is 72.50%, showing a decreasing trend in the level of corporate disclosure with an increase in the disclosure score. This finding compares favorably to Hossain and Taylor's (1998) findings where the mean score is 29.33. Compliance with accounting standards disclosure by listed companies was better in another study by Hossain (2000), where the average compliance level is 69.05% with a minimum and maximum level of 35.85% and 94.34%, respectively. Nevertheless, conformity with mandatory disclosure by Bangladeshi firms is low compared to firms in other countries. For example, the average mandatory disclosure for Zimbabwe firms is 74.43% (Owusu-Ansah, 1998).

Whether or not company age influences the level of disclosure is examined by using lambda analysis (Table 3). For purposes of this analysis, the sample companies are

Table 3
Disclosure of information by age

Disclosure index	Age of the company			Total
	Very old company	Old company	New company	
Up to 20			1	1
21–30	1	3	4	8
31–40	4	14	16	34
41–50	1	8	12	21
51–60	4	10	5	19
61–70	2	7	1	10
71 and above		1		1
Total	12	43	39	94
χ^2	Significance	Contingency coefficient		λ
12.213	.429	.0339		.000

Table 4
Disclosure of information by status

Disclosure index	Status of the company		Total
	Traditional	Modern	
Up to 20		1	1
21–30	7	1	8
31–40	17	17	34
41–50	11	10	21
51–60	9	10	19
61–70	2	8	10
71 and above		1	1
Total	46	48	94
χ^2	Significance	Contingency coefficient	λ
10.162	.118	.312	.000

classified as very old, old, and new companies depending on when they first registered with the Registrar of Companies. The results did not support the hypothesis that old companies will provide more information than new ones.

5.2. Disclosure performance by status

Disclosure was expected to depend on the status of a company. Modern companies are likely to disclose more information than that of traditional companies. Table 4 shows that out of 94 companies, 49% falls in the category of traditional companies and the remainder 51% in the category of modern companies. It can also be seen from the table that 24% of traditional and 40% of modern companies have a score of more than 51%. Lambda reveals no association between disclosure and status of the companies.

5.3. Size-wise disclosure

Corporate size can be represented by many different indicators. Karim (1996) uses annual sales, total assets, and market value of the firm to measure size, whereas Hossain (2000) uses sales turnover and total assets as size variables. In this study capital employed and annual sales are used as the measures of company size. The relationship between size and disclosure is shown in Tables 5 and 6.

Larger companies are expected to disclose more information. As can be seen from Table 5, at 51–60% the disclosure level of 21% have capital employed of Tk. 100 to 200 million. The same percentage was also found for companies with Tk. 200 to 400 million, whereas 53% of the companies have capital employed at the Tk. 400 million and above level. Again, for ten companies at the 61% to 70% disclosure level, 50% have capital employed of Tk. 200 to 400 million, 20% of Tk.400 to 800 million, and 30% of Tk.1600 million and above.

From Table 6 it can be seen that no company with sales of less than Tk. 100 million 51% to 60% level. Out of the 19 companies at this level, 37% had sales of Tk. 200 to 400 million, and 37% had sales of 400 to 800 million. Three companies had sales of Tk. 800 to

Table 5
Disclosure of information by size

Disclosure index	Total capital employed							Total
	Up to 50	50–100	100–200	200–400	400–800	800–1600	1600 and above	
Up to 20			1					1
21–30	3	1		2		1	1	8
31–40	7	7	6	9	3	1	1	34
41–50	1	1	8	3	8			21
51–60	1		4	4	7	3		19
61–70				5	2		3	10
71 and above					1			1
Total	12	9	19	23	21	5	5	94
χ^2	Significance		Contingency coefficient		λ			
64.631	.002		.638		.183			

1600 million and one company had sales of Tk. 1600 million and above. At the disclosure levels of 61% and above there are no smaller companies.

This analysis indicates that the size of the company in regard to capital employed and sales does have a little impact on the disclosure of information. Lambda, too, reveals the same conclusion. However, the influence of size was found to be significant in the studies of both Karim (1996), and Hossain (submitted for publication).

5.4. Profitability and disclosure

The profitability variable is used by many researchers (Hossain, 2000; Inchausti, 1997; Karim, 1996; Owusu-Ansah, 1998; Wallace & Naser, 1995; Wallace et al., 1994), although the measures of profitability were not similar in all these studies. These studies used net profit to sales, rate of return on assets, earnings growth, and dividend stability. The two profitability measures used in this study are net profit on capital employed and net profit

Table 6
Disclosure of information by size

Disclosure index	Annual sales							Total
	Up to 50	50–100	100–200	200–400	400–800	800–1600	1600 and above	
Up to 20	1							1
21–30	4	1			3			8
31–40	12	2	9	9	2			34
41–50	2	4	3	4	6	2		21
51–60			1	7	7	3	1	19
61–70				4	2	1	3	10
71 and above						1		1
Total	19	7	13	24	20	7	4	94
χ^2	Significance		Contingency coefficient		λ			
79.592	.000		.677		.217			

Table 7
Profitability and the level of disclosure

Disclosure index	Net profit on capital employed							Total
	Loss	Up to 2	2–4	4–8	8–16	16–32	32 and above	
Up to 20	1							1
21–30	8							8
31–40	11	8	4	7	3			34
41–50	3	3	3	4	7	1		21
51–60		1	1	4	7	5	1	19
61–70				2	6	1	1	10
71 and above		1			1			1
Total	23	14	8	17	23	7	2	94
χ^2	Significance		Contingency coefficient		λ			
77.950	(000)		0.73		16.7			

on sales. The relation between net profit on capital employed and the disclosure index is presented in Table 7.

About 25% of the companies under study suffered losses, whereas 32% enjoyed profits between 8% and 32% on capital employed. At these profit levels, 20% of the companies fall at the 60% and below disclosure level, and 12% face at the disclosure level of 61% and above. Thus, analysis indicates a very low degree of association between net profit on capital employed and corporate disclosure.

An examination of the association between net profits on sales and the disclosure level also reveals that association was not significant enough to reject the null hypothesis (Table 8). Lambda accepts a low level of association between disclosure and profitability in terms of both net profits on capital employed and net profits on sales. Both Karim (1996) and Hossain (2000) found a positive association between profitability and disclosure. The finding of the present study is not incongruent with them; it shows a low level of association between profitability and disclosure. According to Zubaidah and Koh (1999), a more profitable company could have disclosed more information in order to improve its image. The standard

Table 8
Profitability and the level of disclosure

Disclosure index	Net profit on sales							Total
	Loss	Up to 2	2–4	4–8	8–16	16–32	32 and above	
Up to 20	1							1
21–30	8							8
31–40	11	8	4	5	4	1	1	34
41–50	3	3	5	5	1	4		21
51–60		2	2	7	7	1		19
61–70				2	6	2		10
71 and above		1						1
Total	23	14	11	19	18	8	1	94
χ^2	Significance		Contingency coefficient		λ			
75.537	0.000		0.67		15.0			

Table 9
Descriptive statistics

	Mean	Std. deviation	N
Disclosure index	3.88	1.23	94
Age of the company	2.29	.68	94
Status of the company	1.51	.50	94
Total capital employed	3.71	1.61	94
Size of annual sales	3.60	1.74	94
Net profit on capital employed	3.34	1.79	94

deviation of each group is approximately equal suggesting that the equal variance assumption is met (see Table 9, descriptive statistics).

The degree of variability in the case of age and status of the company is much lower compared to other variables in the study. Thus we can reject the null hypotheses that there is no association between disclosure and size and between disclosure and profitability.

5.5. Multivariate test

Regression analyses were run using ordinary least squares (OLS) estimates and are reported in Table 10. Estimates of regressions are substantially better than that of univariate analysis. Regression has been used in much previous research (e.g., Cooke, 1989; Owusu-Ansah, 1998; Wallace & Naser, 1995; Wallace et al., 1994). The results of the estimation procedure report that company size, profitability, and the intercept have a statistically significant effect on the extent of mandatory disclosure, but at different levels.

Table 10

Regression results					
Coefficient of multiple regression					.759
Coefficient of determination (R^2)					.577
Adjusted R^2					.547
Standard error					.830
Analysis of variance					
	Sum of squares	df	Mean square		F
Regression	81.711	6	13.619		19.746
Residual	60.002	87	.690		
Variables in the equation					
	Unstandardized coefficients		Standardized coefficients		Sig.
	β	Std. error	β	t	
(Constant)	1.789	.537		3.328	.001
Age of the company	-.195	.136	-.108	-1.431	.156
Status of the company	.298	.184	.121	1.614	.110
Total capital employed	-3.603 ⁻⁴	.100	-.005	-.036	.971
Size of annual sales	.307	.108	.432	2.833	.006
Net profit on capital employed	.170	.120	.246	1.420	.059
Net profit on sales	.134	.107	.189	1.254	.213

The intercept is significant at the .001 level. Company age is significant at the .15 level, whereas profitability is significant at .05 level.

The disclosure score, a continuous variable, is used as the dependent variable. The disclosure score for each company is related to company characteristics, the independent variables for the study, such as age, status, size and profitability. The four company attributes were measured on a continuous scale. The explanatory power of the OLS model, as indicated by the adjusted R^2 , is 54.7% ($p < .001$). The R^2 is .577, which reveals that the model is capable of explaining a 57.7% variability in disclosing information in the annual reports of the selected companies. The F statistic indicates that the model employed to explain the variations in mandatory disclosure in company annual reports is significant at the conventional levels ($p < .01$).

The results show that some variables are significant in explaining disclosures. Companies that are larger in size measured by annual sales ($p < .01$) are likely to disclose more information. The positive association between company size and mandatory disclosure is consistent with prior findings (see, e.g. Ahmed & Nicholls, 1994; Cooke, 1989; Meek et al., 1995; Owusu-Ansah, 1998; Wallace & Naser, 1995). Lang and Lundholm (1993) also report that disclosure is higher for larger firms. It is argued that larger firms provide more information because they are likely to face lower cost of disclosure (Ho & Wong, 2001). Furthermore, since larger firms tend to disclose more to meet the increased demand in reducing uncertainty about quality and expected return, they arguably face lower competitive cost of disclosure (Ferguson, Lam, & Lee, 2002).

The hypothesis that companies having higher profitability disclose more information than companies with lower profitability is supported ($p < .05$). Lang and Lundholm (1993) suggest that well-performing firms provide more information in the annual report than do the poor-performing firms. The positive effect of profitability on financial disclosure is consistent with Wallace et al. (1994), Karim (1996), Owusu-Ansah (1998), and Hossain (2000). The managers of profitable firms are motivated to disclose more information to appease shareholders, to enhance company image leading to marketability of shares, and above all to justify their compensation (see Meek et al., 1995; Zubaidah & Koh, 1999).

The t -statistic of industry type is insignificant, indicating that it has a negligible effect on the mandatory disclosure practices of the sample companies. It is consistent with results of Owusu-Ansah (1998), where firms are classified into four broad heads, namely, mining, conglomerate, manufacturing, and others. Inchausti's (1997) findings also do not support an association between industry type and level of disclosure.

Similarly, company age was not found to be as significant a predictor of compliance with mandatory disclosure as expected. An older company was expected to disclose more mandatory information than a younger one. For this study company age is measured from the date of registration with the Registrar of Companies not from the listing date. A listed company has to comply with disclosure and reporting regulations and may require some time to adapt to the new disclosure environment. Public companies having pre-listing experience may, therefore, have no link to a specific level of disclosure. This needs further investigation. Owusu-Ansah (1998) finds a positive association between company age and mandatory disclosure. He defines company age as the experience gained by public companies during the listing periods. Thus, the possible explanation for his findings is that company age in terms of listing status is related to mandatory disclosure.

6. Conclusions, limitations, and suggestions for future research

The aim of this study is to examine the level of mandatory disclosure made by listed companies in Bangladesh. It also investigates the factors that influence mandatory disclosure practice. The findings would be used to improve the quality of corporate disclosure by Bangladeshi companies. The study finds that many corporate annual reports do not meet the disclosure requirements of the regulatory bodies in Bangladesh. On average, the sample companies disclose information on only 43.53% of the items asked for indicating poor compliance with the mandatory rules. This result is better than the findings of Hossain and Taylor (1998), where the mean score is 29.33%. A later study, Hossain (2000), is more encouraging, with average compliance rates for accounting standards disclosure reported at 69.05% with a range of 35.85% to 94.34%. These results indicate that listed companies in Bangladesh place more emphasis on IASs disclosures. This may be the result of the ICAB's efforts to persuade its members who work as either professional accountants or auditors to comply on the results of the ICAB's monitoring. Nevertheless, the available literature reveals that overall compliance with mandatory disclosure by Bangladeshi firms is low compared to firms from other countries. For example, the average mandatory disclosure for Zimbabwe firms is 74.43% (Owusu-Ansah, 1998). The lack-lustre disclosure performance by Bangladeshi firms can be attributed to organizational culture, poor monitoring, and lapse in enforcement by the regulatory body. Disclosure decisions are culture-driven (El-Gazzar, Philip, Finn, & Jacob, 1999). Ho and Wong (2001) argue that in countries where the culture supports a high level of secrecy, managements become less transparent and are less likely to favor a high level of disclosure. Further analysis is required to impound cultural factors. With regard to regulations, Karim et al. (1998) suggest that at present they are ineffective when it comes to monitoring disclosure practices in Bangladesh. Again, regulations alone, according to Ho and Wong (2001), can do little to ensure disclosure because companies view that disclosure excellence lies in the hands of regulatory bodies who work for safeguarding the company's value for shareholders. What the regulatory bodies need to do is to create an environment that helps become aware of the companies consequences of non-disclosure of adequate information in the annual reports.

This study examines the relationship between mandatory disclosure and four corporate attributes; i.e., company age, status, size, and profitability. The four company attributes were measured on a continuous scale. Analysis reveals that the age of the company is not a factor for disclosure. The investigation did not support the hypothesis that old companies will provide more information than new companies. Similarly, company status has no effect on disclosure. Contrary to prior findings (Cooke, 1989; Meek et al., 1995; Owusu-Ansah, 1998), this study finds little support for the relationship between size and the level of disclosure, however, except in respect to sales, where size is marginally significant. The same result is found in the case of disclosure and profitability.

Based upon the findings of this study, the following observations and recommendations have been outlined which may be useful to company managers, financial analysts, investors, and policy makers for the capital market development of the country:

- Companies disclose more information on the cost of sales, providing details of expenses, but there is less compliance with disclosure regulations. Steps should

be taken to ensure that mandatory information items are covered in the annual report.

- The Securities Exchange Commission has already introduced a reward–punishment program to ensure that listed companies disclose adequate information in their annual reports. The enforcement program, however, has not been effective. A committee could be formed representing investors, financial institutions, and academicians to appraise the published accounts and give their observations.
- The Companies Act 1994 does not include a provision for publication of either a Statement of Sources and Application of Funds or a Statement of Cash Flow. The IAS-7, however, adopted a cash flow statement for use in Bangladesh. This standard allows a cash flow statement to be prepared in two ways, viz. the direct or indirect method. The Companies Act should also include a provision about the preparation of cash flow statements.

The Bangladeshi capital market is not efficient and well structured. An increase in the flow of free and accurate disclosure would help the capital market develop. Government needs to come forward to protect the interests of the different user groups.

- The responsibility of the auditor is to check whether the accounts are prepared in accordance with accounting policies and requirements of the Companies Act 1994. He or she has to state his or her opinion that the audited accounts give a true and fair view of the state of affairs of the company. Audit reports should also state whether or not disclosure rules are properly complied with.
- With a view to improving disclosure level, an Accounting Board should be set up by the Government with members from both from the Institute of Chartered Accountants of Bangladesh and the Institute of Cost and Management Accountants of Bangladesh. In addition to the adoption of accounting standards and the development of accounting in Bangladesh, the board should have the responsibility of determining the degree of compliance with the disclosure regulations.
- An accounting court could be created to deal with litigations regarding the disclosure of information. An individual who has a direct interest in the annual reports of a company could bring a charge of non-compliance with the disclosure requirements.
- The present study is limited to only 54% of the companies listed on the stock exchanges. Future research could investigate disclosure performance of all the listed companies. Research could also explore the variations in disclosure between listed and unlisted companies. Examining similar research issues within different industry sectors would also be an interesting extension of this study. This might reveal interesting results in terms of variations within the industrial sectors.
- Any opinion survey of users of company annual reports could be conducted. Such a survey would provide additional insights on corporate disclosure practices in Bangladesh.
- Finally, this study covers the annual reports for a single year only. Additional research is needed to assess the trends of disclosure and to know whether the quality of disclosure has improved over time.

Appendix A. Disclosure index

Historical summary

1. A brief description of the nature and principal activities of the company and its subsidiaries
2. The country of incorporation and the address of the registered office
3. Names of the top employees, lines of authority and their remuneration
4. List of directors
5. Outside affiliations of the directors
6. Audited financial statements (balance sheet and profit and loss account)
7. Audit report
8. Report of the chairman or CEO
9. Statement of cash flows
10. Holdings in associates and subsidiaries with the relative percentage
11. Statement of changes in the share capital
12. Number and types of shareholders
13. Names and size of holdings of largest shareholders
14. Significant changes in the company's or its subsidiaries' fixed assets and the market value of land, if the value differs substantially from the book value
15. The date when the financial statements were authorized for issue and who gave that authorization
16. Post-balance-sheet events
17. Discussion of major factors which will influence next year's results
18. Forecast of company performance
19. Comparative balance sheet for two years

Balance Sheet Items

20. The total carrying amount of inventories
21. Inventories are sub-classified as merchandise, production supplies, materials, work in progress, and finished goods
22. Inventories carried at net-realizable value
23. Amount of inventories pledged as security for liabilities
24. Cash and cash equivalents
25. The components of cash and cash equivalents should be disclosed and a reconciliation of the amounts in the cash flow statement with the equivalent items reported in the balance sheet should be presented
26. Trade and other receivables
27. Receivables are analyzed by amount from trade customers, from other members of the group, and from related parties
28. Advances and loans to staff or directors
29. Advances and loans to partnership firms in which the company or any of its subsidiaries is a partner
30. Advances recoverable in cash or in kind or for value to be received, e.g., rates, taxes, and insurances, etc.
31. Interest accrued on investment
32. Provision for provident fund scheme
33. Secured short-term borrowings
34. Unsecured short-term borrowings
35. Unpaid dividends
36. Provision for doubtful debts
37. Trade and other payables
38. A brief description of the nature of the contingent assets/liabilities
39. Provision for taxation
40. Provision for proposed dividends
41. Provision for gratuity
42. Provision for contingencies
43. Provision for insurance, pension, and similar staff-benefit schemes

(continued on next page)

Appendix A *(continued)*

44. Provision for liabilities
 45. Deferred tax liabilities
 46. Classification of assets and liabilities
 47. Aggregate value of intangible assets
 48. Breakup of intangible assets
 49. Aggregate amount of investments
 50. Investment in subsidiary companies
 51. Investment in associated companies
 52. Investment in quoted and unquoted shares other than group
 53. Investment in government securities
 54. Value of land and buildings
 55. Amount of the leasehold property
 56. Reconciliation between the total of minimum lease payments at the balance sheet date and their present value
 57. Cost of furniture and fittings
 58. Expenditure upon development of property
 59. Patents, trade marks, and designs
 60. A company with subsidiaries should annex a set of consolidated financial statements to its own financial statements
 61. Minority interests in the consolidated financial statements to be shown separately
 62. Total carrying amount of property, plant, and equipment
 63. The measurement bases used for determining the gross carrying amount of property, plant, and equipment. When more than one basis has been used, the gross carrying amount for that basis in each category should be disclosed
 64. A reconciliation of the carrying amount of property, plant, and equipment at the beginning and end of the period showing additions/disposals/acquisitions/impairment losses
 65. The existence and amounts of restrictions on title, property, plant, and equipment pledged as security for liabilities
 66. Accumulated impairment losses at the beginning and end of the period
 67. The amount of commitments for the acquisition of property, plant and equipment
 68. In case of revaluation of property, plant, and equipment it should include: the firm's policy on revaluation; the basis used to revalue the assets; and the effective date of revaluations
 69. Research and development costs recognized as an asset
 70. The amount of goodwill/negative goodwill arising on the acquisition
 71. The gross amount of depreciable assets and the related accumulated depreciation
 72. Non-current interest-bearing liabilities
 73. Loans from directors
 74. Long-term liabilities are disclosed separately showing the nature of the recipients such as secured loans, unsecured loans, inter-company loans, and loans from associated companies
 75. The amount of borrowing costs capitalized during the period
 76. The capitalized rate used to determine the amount of borrowing costs eligible for capitalization
 77. Share capital: authorized, issued, subscribed, called up and paid up
 78. Number of shares held by directors
 79. A reconciliation of the number of shares outstanding at the beginning and at the end of the year
 80. Par value per share, or that the share have no par value
 81. The rights, preferences, and restrictions for each class of share including restrictions on the distribution of dividends and the repayment of capital
 82. Shares in the enterprise held by the enterprise itself or by subsidiaries or associates of the enterprise
 83. If any shares or debentures have been issued, the number, class, and consideration received and the reason for the issue
 84. Particulars of any option or unissued share capital
 85. A description of the nature and purpose of each reserve
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Income Statement:

86. Sales revenue, aggregate amount
87. Amount of revenue in each significant category of revenue
88. The cost of inventories sold during the period
89. Finance costs
90. Share of results of jointly controlled entity and associates
91. Profit or loss from ordinary activities
92. Any exceptional or unusual credits or charges
93. Profit or loss arising from sale or disposal of fixed assets
94. Break up of income from investments
95. Directors' remuneration
96. Auditors' remuneration for services as auditors
97. Amount paid to or receivable by third parties in respect of services rendered by any past or present directors to the company or its subsidiaries
98. Recognition and depreciation/amortization of tangible assets
99. Recognition and depreciation/amortization of intangible assets
100. The amount adjusted to net profit or loss due to change in accounting policy
101. The amount of the correction recognized in net profit or loss for the current period
102. The effect of the acquisition/disposal of subsidiaries on the financial position
103. The net profit or loss for the periods
104. The tax expense (income) related to profit or loss from ordinary activities should be presented on the face of the income statement
105. The major components of tax expense (income) should be disclosed separately
106. Tax expense relating to extraordinary items
107. Brokerage and discount on sales other than the usual trade discounts
108. The amount set aside to any reserve but not including provisions made to meet any specific liability, contingency, or commitment
109. Amount set aside or provisions made for meeting specific liability, contingency, or commitment
110. Workmen and staff welfare expenses
111. Separate disclosure of staff remuneration not less than Tk. 36,000
112. Commission or other remuneration payable separately to a managing agent or his associate
113. Research and development costs recognized as an expense
114. Disclosure of pension costs
115. Payment for gratuity
116. Information regarding the licensed capacity, installed capacity, and actual production
117. Expenditure in foreign currency on account for royalty, know-how, professional consultation fees, interest, and other matters
118. Value of percentage of all imported and local raw materials, spare parts, and components consumed
119. Amount remitted in foreign currencies on account of dividends to non-resident shareholders, the number of shares held by them, and the year for which the dividend is being paid
120. Foreign exchange earnings for export of goods (FOB price), royalty, know-how, professional and consultation fees, interest and dividends, other income and its nature
121. Advertisement expenditure
122. Social security costs
123. Pension costs contribution plan
124. Contributions in excess of Tk. 50,000 made to government approved charities or other charities
125. Basic earnings per share
126. Diluted earnings per share
127. The amounts used as the numerators in calculating basic and diluted earnings per share, and a reconciliation of those amounts to the net profit or loss for the period
128. The weighted average number of ordinary shares used as the denominator in calculating basic and diluted earnings per share, and a reconciliation of these denominators to each other
129. Comparative profit and loss accounts for two years

Appendix A (continued)

Accounting Policies

130. The measurement basis used in preparing the financial statements
131. The reason and nature of a change in an accounting policy
132. Statement of compliance with approved IASs
133. Basis of consolidation
134. The accounting policies adopted in measuring inventories, including the cost formula used.
135. The accounting policies adopted for the recognition of revenues
136. The accounting policies adopted for research and development costs
137. The amortization methods used and the useful lives or amortization rates used for research and development costs
138. Disclose firm policy for foreign currency risk management
139. The depreciation methods used
140. The useful lives or the depreciation rates used
141. Method of valuing goodwill
142. The methods used to account for investments in associates
143. Accounting policy for borrowing costs
144. Accounting policy for actuarial gains and losses
145. Treatment of retirement benefits
146. Treatment of preliminary expenses
147. Methods of advance payments
148. Purchase policy
149. Sales policy
150. Deferred taxation system
151. Conversion or translation of foreign currencies
152. Treatment of contingent liabilities

Director's Report

153. The state of the company's affairs
154. Amount proposed to carry to any reserve
155. Recommended dividend
156. Material changes and commitment affecting the financial position of the company that occurred between the year and the date of report
157. Changes in the nature of the company's business during the year
158. Changes in the company's subsidiaries or in the nature of their business
159. Changes in the classes of business in which the company has an interest
160. Explanation and information of every reservation, qualification, or adverse remark in the auditor's report

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Book Review Section

The book review section is interested in works published in any language, as long as they are comparative or international in character. The author or publisher of such works should furnish the book review editor with two (2) copies of the work, including information about its price and the address where readers may write for copies. Reviews will be assigned by the book review editor. No unsolicited reviews will be accepted. Suggestions of works that might be reviewed are welcomed.

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Book reviews

Kevin Keasey, Steve Thompson, Mike Wright (Eds.), *Corporate governance: Accountability, enterprise and international comparisons*, 2005, xviii + 464 pages, £34.95, ISBN 0-470-87030-3

This is a collection of 17 essays commissioned especially for this volume on various aspects of corporate governance with contributions from 31 authors. Many are the leading researchers in their specialist area within corporate governance. The book has a distinctly Anglo-Saxon flavor, with all but a few contributors coming from the United Kingdom or United States.

In the interests of depth, rather than breadth, the editors have restricted their coverage to four disciplines: Accounting, Finance, Economics, and Governance. As a result, other perspectives, for example, from the social sciences including politics and sociology, are not to the fore in this volume. Chapters comprise overviews of recent research on corporate governance topics, and on governance developments within particular countries and institutional regimes.

The collection takes both a micro and macro perspective. At the micro level, a traditional Anglo-American approach is taken. In their introductory chapter (Chapter 1), the editors comment that this Anglo-American perspective involves protecting the downside risk of shareholders (i.e., accountability of managers) while encouraging managers to take risks to increase shareholder value (i.e., encouraging managers to act entrepreneurially)—which strikes me as a difficult conflict to reconcile, and which merits more discussion.

Keasey, Short and Wright (Chapter 2) deal with developments in corporate governance codes in the United Kingdom. This is a handy summary from publication of the Cadbury Report in 1992 to the 2003 Combined Code. The chapter contains two useful tables: the first summarizing the chronology of these corporate governance developments in the United Kingdom (Table 2.1), and the second summarizing governance requirements from the Cadbury Report to the 1998 Combined Code (it is a pity Table 2.2 did not cover the requirements of the latest 2003 Combined Code).

At the micro level, specific governance issues are addressed including capital structure, institutional shareholders, boards of directors and non-executive directors, executive pay, board compensation sub-committees, governance and strategic leadership, and the governance roles of takeovers and of venture capitalist and buy-outs. In a short chapter, Watson and Ezzamel (Chapter 3) review the agency cost literature starting with Jensen and Meckling's (1976) seminal paper and consider whether firms are better financed by debt

rather than by equity. Other stakeholders, in particular employees, are also discussed as residual claimants of the firm.

Short and Keasey (Chapter 4) examine institutional shareholders in the United Kingdom. A number of useful tables summarize the pattern of share ownership from 1963 to 2002, the extent to which shares are directly or indirectly (through pension funds and life assurance products) owned by individuals, and the value of institutional holdings at the end of 2002. Corporate governance interventions (or lack thereof!) by institutional shareholders are reviewed, together with the effect of size, the free-rider problem, and conflicts of interests on behavior. Mechanisms of intervention are also considered. The chapter ends with a review of the empirical literature on these topics.

In a chapter on the role of the board and of non-executive directors (Chapter 5), Ezzamel and Watson start by reviewing the literature, attempting to relate board composition with firm performance. The authors adopt the generally accepted perspective that the primary or sole objective of boards is to further the interests of shareholders—a questionable view in my opinion. The United Kingdom Combined Code's comply-or-explain approach, and the value to good governance of disclosure, is then considered.

Bruce and Buck (Chapter 6) review executive pay in the United Kingdom, including empirical findings. The evolution of pay structures is also discussed, in particular performance-related pay such as executive share options and long-term incentive plans. Performance indicators used as the basis for measuring company performance in long-term incentive plans and other discretionary elements are considered.

All but one chapter in the book comprises a review of the literature. However, Bonet and Conyon report the results of a study of the compensation committees of 819 United Kingdom listed firms in 2002 (Chapter 7). They document size and number of insiders (defined as executive directors) on these committees. They define poorly constituted compensation committees as those containing insiders. Only 87 (11%) firms have insiders, 14 of which have two or more insiders. Executive compensation is found to be higher where insiders are present on the compensation committee.

Takeovers have long been considered to play an important role in governance and O'Sullivan and Wong review the literature in this area (Chapter 8). Their review covers each stage of the takeover process, starting with firm performance at the pre-bid stage, followed by the likelihood of takeover success, post-acquisition performance, and management turnover subsequent to takeover. The consequence of takeover failure is also considered and the chapter ends by acknowledging the value of abandoned takeovers.

Dalton, McDougall, Covin and Dalton (Chapter 9) consider the relationship between governance, strategic leadership and firm performance. They focus on entrepreneurial firms and select only studies where firm performance is the dependent variable. They identify four firm performance categories: financial performance (accounting and market-based measures), performance at initial public offering, growth of the firm, and firm survival. Strategic leadership is examined by reference to CEO founders/non-founders and the demography of top management teams. Their governance constructs comprise CEO duality (i.e., role of chairman and CEO separated/combined), board composition, and board size. The role of venture capitalists in imposing governance structures in fledgling firms is also considered. Usefully, for research students, the authors conclude their chapter by identifying many promising areas for future research.

Wright, Thompson, and Burrows' chapter that follows further develops our understanding of the role of venture capitalists and buy-outs in dealing with corporate governance problems (Chapter 10). They examine corporate governance problems likely to lead to buy-outs and the intervention of venture capitalists, and corporate governance problems associated with buy-outs and venture capital investments. The chapter has two parts: a discussion of theoretical issues, followed by empirical evidence.

At the macro level, international corporate governance is examined, with chapters on Germany, France, Japan and China. This macro-orientated part of the book starts with a chapter by Roe on western securities markets, in which he provides legal and political explanations for securities markets (Chapter 11). Denis and McConnell then provide a chapter on international corporate governance (Chapter 12). This starts by summarizing internal and external corporate governance mechanisms. They then review what they call "first generation" corporate governance research, followed by "second generation" international corporate governance research. They conclude their chapter by identifying convergences in corporate governance systems, and point to areas for further research.

Goergen, Manjon, and Renneboog contribute a chapter on corporate governance in Germany (Chapter 13). Using the Japanese banking industry, Wan, Hoskisson, Kim, and Yiu take a social exchange perspective that examines the complex and rich social relationships including embedded social systems of roles, power, reciprocity, expectations, and obligations that influence governance (Chapter 14). Mary O'Sullivan contributes a chapter on corporate governance in France (Chapter 15), as a continental European system of governance (described as insider systems) subject to the pressure of financial markets. She concludes her analysis of the French system of corporate governance by noting that there has been little shift from an insider to outsider system of governance.

Liu and Sun (Chapter 16) take an ownership and control perspective to examine China as a state-dominated governance system. They report the results of their forthcoming paper on the performance effects of different levels of state and private ownership in Chinese firms. They also report the results of a study of the economic and regulatory determinants on ownership in state-controlled Chinese public companies. This chapter provides insights on efficient governance structures in the context of emerging markets and transition economies.

Wright, Buck and Filatotchev contribute the concluding chapter which reviews corporate governance mechanisms in transition economies (Chapter 17). They examine different approaches to privatization, using the experiences of Hungary, Poland, Russia, Ukraine, Czech and Slovak republics, and Bulgaria by way of illustration. The contribution of various stakeholder groups to governance of central and east European countries is discussed, including inside ownership, banks, domestic and foreign companies, venture capitalists the state, etc. The chapter concludes by reviewing studies of the effects of different ownership and governance forms, and contains two excellent tables summarizing prior research (Tables 17.4 and 17.5).

This is primarily a book for academics, not practitioners. It is a one-stop shop summarizing most of the recent corporate governance literature and as such is suitable for researchers and research students beginning to study this area. For existing researchers it presents a readable and comprehensive opportunity for a refresher of the literature. Every chapter ends with a long and thorough list of references on the topic (including the latest

literature). However, I do not believe (as stated in the flier for the book) that it is “*essential reading for students studying corporate governance for undergraduate, MA or MBA degrees.*” In my opinion, such students need a more introductory text on corporate governance, such as Mallin (2004), Monks and Minow (2004), or Solomon and Solomon (2004).

Taking account of the track record of many of the contributors, it is not surprising that the quality of the contributions is of the highest standard. Most of the chapters are written in an accessible style. The book has a useful and extensive index.

I prefer this book to another similar series, also edited by Keasey, Thompson, and Wright, and published by Edward Elgar Publishing. The Edward Elgar series (of which there are six volumes published/due for publication) comprises reprints of previously published academic articles in each volume, rather than original commissioned articles as in this book.

In my opinion, this is a must-have book for researchers and scholars of corporate governance.

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D.R. Myddelton, Unshackling Accountants, The Institute of Economic Affairs (IEA), London, 2004 (194 pages, £12.50, ISBN: 0 255 36559-4)

This short nine-chapter text is published by a U.K. free-market think tank, The Institute of Economic Affairs (IEA), whose goal is to explain free-market ideas to the public, including politicians, students, journalists, businessmen, academics, and anyone interested in public policy. As the organization’s website professes, “IEA authors. . .are. . .always on the lookout for ways of reducing the government’s role in our lives.” This text supports this aim by providing a cogent and fierce attack on accounting regulation and regulators. It argues that accounting regulators are mistakenly promoting “revolutionary” principles and (measurement) standards that impose the view that the primary purpose of financial statements is to enable the prediction of future cash flows (a decision-usefulness

approach). This conflicts with the author's view that the key role for financial statements should be to monitor managers' stewardship. The "vast majority" of companies and practicing accountants, it is claimed, oppose these principles and standards. They are frequently motivated by tenuous evidence linking accounting scandals to deficiencies in accounting regulation and often operate to ignore accounting's inherently subjective nature. While accounting may require rules, it is argued that these will most likely evolve through competition in use rather than through standardized imposition.

The author initially reviews the purpose of company accounts, the emergence of United Kingdom and international accounting standards, and somewhat selective arguments for and against these standards. He also explores resistance to emergent conceptual framework projects, political interference in standard setting and the role of various private and public sector bodies in setting standards.

The trend by regulators towards viewing company accounts as instruments for predicting future cash flows is strongly criticized. At the same time, the author vehemently defends monitoring the stewardship of managers as the primary purpose of company accounts ("the least imperfect approach" [p. 27]). Here is the core of the arguments in chapter 1 which dismisses perceived attempts by accounting regulators to turn company accounts into quasi-prospectuses:

"By putting the emphasis on decision-usefulness for investors, the ASB (the U.K. accounting standards setting body) is in effect regarding company accounts as if they were annual prospectuses" (p. 30).

The various conceptual-framework projects in the U.S. and U.K. are accused of ignoring "most professional accountants' preferences" and of failing to "characterise accounting as it is, only how it might be" (p. 39, quotation from Page, 1992). This apparently digresses from what "most people" think accounts are actually for and represents a "revolution" by a regulatory elite. It is deemed a "fact" that fundamental analysis of accounting reports is "not very useful to investors" for predicting future profits. No allusion is made, however, to the growing popularity of residual income valuation models drawing mainly on accounting numbers as the basis of fundamental company valuation. Furthermore, in quoting Beaver in support of this argument (p. 44), a rather unquestioning adherence to the efficiency of markets is betrayed.

The emergence of accounting standards in the United Kingdom, the European Union and United States of America is critiqued in chapters 2 and 3. Throughout the text, the author promotes the view that "professional" accountants should be free to "make up their own minds" as "the question remains whether any group of people should tell professional accountants in great detail how to do their job" (p. 59). However, given widespread concerns about the role of the accounting profession, it would have been helpful if the author had elaborated on this notion of "professionalism" among accountants he believes should be left to their own devices. The trend towards "harmonization" is also challenged by suggesting that a strong empirical case linking more "informative" disclosure to lower costs of capital has not yet been made.

Chapters 4 and 5 argue for and against accounting standards. Preventing dishonesty among account preparers and combating a perceived lack of auditor independence are briefly outlined and dismissed as arguments in favor of standards. It is suggested that

possible damage to investors from an absence of standards is unproven but this point requires more development and stronger support. For example, it is partially supported by stating that

"Between 1945 and 1969 the ICAEW issued Recommendations to its members, while the Scottish Institute preferred not to. But no one suggests that Scottish company accounts were therefore of lower quality than English ones. So is there any reason to suppose that the absence of accounting standards after 1970 would have damaged UK investors?" (pp. 87–88).

We are also informed that the best way to get stock markets to reflect relevant news managers possess is to allow insider trading in order to make stock prices better guides to value for the investing public. Many readers may ponder long and hard about this suggestion.

It is further maintained that the complexity of accounting decisions could be reduced by merely providing advice (or "suggestions") on technical issues as opposed to mandatory guidance. However, a rather alarmist example is used to support this point:

"Relying on authority to compel truth can be dangerous, as the examples of Nazi mathematics and Soviet biology from the last century remind us" (p. 89).

Some standards are accused of complicating measurement and presentation. FRS 3's profit and loss account layout is deemed "hard to follow" although later it is recommended that this standard be kept (given its focus on disclosure as opposed to measurement). In essence, more complexity requires more discretion on the part of directors and auditors and less regulation. The role of standards in enhancing comparability is deemed irrelevant if one does not regard valuation as one of the main purposes of accounts.

The arguments against standards include their tendency to stifle independent judgment given that accountants and company directors are required to follow orders. This apparently outlaws thinking and imagination thereby potentially crippling the profession. However, how exactly this might prove "crippling" is not explored. It is also contended that standards prevent competition in ideas in contrast to voluntary regimes which permit pondering on difficult subjects with views changing slowly. Standards are also blamed for legitimizing some "bad" accounting with recent standards on goodwill receiving critical treatment. Finally, standards raise "public" expectations and create "a climate of false security" (p. 108, quotation from Clarke, Dean, & Oliver, 1997, p. 37) whereby too much is expected from accounts. Accountants are requested to resist pandering to ignorance by implicitly promising the public something they cannot deliver.

The responses of the (then) Big 8 to the U.K. ASB's initial *Statement of Principles* draft are subsequently used to highlight the disdain "practical" accountants feel for this "balance sheet approach." The way some principles have been "fudged" in subsequent standards is highlighted and in a typically provocative manner the author claims that:

"...the ASB sometimes gives the impression of a highly exclusive religious sect, vouchsafed from heaven, whose destiny is to steer the benighted masses of old-fashioned accounting professionals towards the promised land, even against their own instincts" (p. 113).

Chapter 7 is devoted to highlighting political interference in standard setting and a particular emphasis is placed on the interference in the development of forms of inflation accounting in the U.K. in the 1980s. Government interference from all sides of the political spectrum appears to have rendered current purchasing-power accounting (favored by the author) redundant as a potential solution.

At this stage of my reading, I was beginning to beg for some balance in the narrative, given its often overbearing "government regulation/standards bad-free markets/free "professional" accountants good" philosophy. The author challenges the reader to consider if there really were so many more or worse accounting scandals before standards were introduced. He also asserts that some accounting scandals were due to public ignorance but fails to support this with convincing evidence. In essence, he argues that scandals will always be with us, so there is little point issuing standards to try to prevent them. We must accept their inevitability and place our faith in an expert "free" accounting profession unburdened by restrictive regulation.

Chapter 8 proceeds to consider various regulatory agencies and discusses some perceived costs and benefits of regulation. Its concluding section entitled "An accounting regulator from hell" effectively summarizes many of the author's key points in the form of this regulator's "ten deadly sins." This is an amusing, if somewhat alarmist and sometimes contentious list.

The author's conclusions are clear and somewhat more reasoned than much of the preceding narrative. He recommends very short, voluntary guidelines ("suggestions") on basic matters of disclosure for public listed companies only with no compulsory accounting standards, no standards on measurement and no standards whatsoever for unlisted or small companies. He reiterates his view that revolutionary regulators are overturning "orthodox" accounting despite little evidence that investors have been damaged in the absence of accounting standards. His so-called "sensible proposal" (p. 168) is that standards on measurement should be abandoned but that disclosure standards could remain. Auditors and management would simply agree on how items should be measured and then relay this in the accounts. He concludes that in an ideal world, accounting standards would not be necessary. His faith in professional practicing accountants is undimmed throughout and this "class" of professional seems to be implicitly beyond rebuke.

In conclusion, this is a stimulating book with many controversial proposals. It is somewhat polemical and is selective with its evidence. "Self-evident" claims which it is assumed brook no argument litter the text and there are too many references to "most people" or "everyone" agreeing with statements by the author. I found the rather stark uncritical "free markets" agenda pervading the contents devoid of any attempt at balance in places. However, this bias also serves to excite interest throughout and the arguments presented invite rebuttal and debate from all sides of the accounting (and political) spectrum, particularly from accounting regulators. I look forward to the accounting regulators' responses.

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2. All manuscripts must be double-spaced and numbered consecutively, including an abstract of approximately 100 words, and key words for indexing consistent with JEL Index. Submitted papers must be neither previously published nor submitted elsewhere. Authors are responsible for obtaining permission from the copyright holder (usually the publisher) to use any lengthy quotations, illustrations, or tables from another source.
3. Books to be reviewed should be sent to Hervé Stolowy, HEC School of Management, Department of Accounting and Management Control, 1, rue de la Libération – 78351, Jouy-in-Josas Cedex, France.
4. The author's full name, affiliation, and e-mail address should appear on the title page only.
5. All tables, figures and illustrations should accompany the manuscript each typed on a separate sheet. Captions should clearly identify the contents of tables and charts. All should be referred to in text and indication given as to location. For example:

TABLE 1 ABOUT HERE.

6. Footnotes should be numbered consecutively throughout the manuscript with superscript Arabic numerals. They should be collected in a separate file at the end of the text.
7. References should be cited in the text as follows:

Schweikart and O'Conner (1989) agree with this method. Other studies have found similar results (Smith, 1991).

On a separate **References** page(s), each cited work should appear, double-spaced, in alphabetical order as follows:

Journal Articles

Barth, M. E., Clinch, G. J., and Shibano, T. (1999). International accounting harmonization and global equity markets. *Journal of Accounting and Economics*, 26, 201–235.

Books

Neter, J., Wasserman, W., and Whitmore, G. A. (1993). *Applied Statistics* (4th ed.). Needham Heights, MA: Allyn & Bacon.

Hofstede, G., and Schrueder, H. (1987). A joint reply to Montagna. In: B. Cushing (Ed.), *Accounting and Culture* (pp. 29–30). Sarasota, FL: American Accounting Association.

8. Upon acceptance the author is to submit one copy of the approved manuscript properly edited for style and the English language. The accuracy of the final draft and proofs is the responsibility of the author.



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